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SYNOPSIS

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TITLE:

INFLUENCE OF INNOVATION FRAMEWORK ON ORGANISATIONAL PERFORMANCE

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SUMMARY

Title: Influence of Innovation framework on Organizational Performance

Context: The business environment is extremely competitive. The performance demands value-driven business outcomes, where, the product and technology lifecycles are critical. Continuous innovations become a necessity for better business performance and to survive and grow. Appropriate insights are essential for successful business performance, these can be achieved by proper monitoring of processes. For success to continue and business to prosper, business needs to build through innovations. The insight and capability to leverage knowledge for Innovation is the task that businesses must perform. Within the process and management of innovation, it would be necessary that they have some method to measurement it. This would help in management and efficiency to deliver.

Objective: This research study explores the concept of innovation, innovation frameworks, key elements that are enablers of innovation. The degree of empirical validation and context of studies was also investigated by looking for influencing parameters that may be monitored as a prospect. It also elicited the perception of innovation, its importance, challenges, and state of practice of innovation measurement in the software industry.

Methods:

The study deals with perception about the innovation capital, as Human intellectual capital, the structural capital, Relational and Networking capital, Innovation value chain and Absorptive capacity.

This study explains the effect perceived about the enablers of innovation as the capability assets, and they are responsible for innovation activities and the capability building. The Analysis is by inferential studies the research design measures influence of Innovation framework on Innovation outcome using structural equation modelling. Statistical Tools used are CMIE's Prowess database Ver 1.95, SPSS Ver 23 and IBM AMOS Ver 22.

The study has been carried out for three industry sectors at an organizational level. The study is a perception study done using 70 items reduced to 7 factors, which was carried out for 42 companies for 14 for each sector with over 1000 responses.

The relation here under study is that Innovation activity gives rise to Innovation performance outcome and this is aided by the absorptive capacity within the organization. The innovation

activity is reflective of the factors like intellectual capacity, the Relational capital, the administrative and structural capital of a company. These are static measures. To give it the kinetic energy there has to be a propensity in terms of the innovation value chain. And in this study, we see the interaction and influence of these parameters tested with 11 hypothesis statements made

Results: Based on the findings of the literature review, interviews and questionnaires a comprehensive "concept of Innovation" definition of innovation was identified. A model was identified which is a decent fit. The metrics for the evaluation of determinants, inputs, outputs, and performance were aggregated and categorized. This conceptual model of the key measurable elements of innovation was developed from the findings from the literature review. The major finding is that the absorptive capacity plays a major role in the process of innovation as a capability built up.

The model tests for the understanding of the drivers of innovation and the degree to which they might influence the innovation outcome. The model also checks for the difference if any for the three sectors that are mentioned for the drivers to influence the Innovation outcome.

The model has been built and tested using confirmatory factor analysis and model using structural equation modeling.

Discussion: The importance of innovation measurement is well recognized in both academia and industry. However, innovation measurement is not a common practice in the industry. Some of the major reasons are lack of available metrics and data collection mechanisms to measure innovation are due to the nature of innovation and its influencing factors being intangible.

Conclusion:

Innovation Performance for Success Indicator are measured in this measurement study. The measurement for Innovation framework and enablers provided in this study can be understood as generic building blocks for any innovation performance measurement initiative. The mediation of Absorptive capacity is essential component. Related outcomes are as follows.

- The link between innovation and innovative framework components quantified for the Innovation Capital, Value chain and Absorptive capacity.
- The measurement Innovation can help organisations strategize with the strength of the linkages.

- The optimization of in resource allocation can also be established by linkages measured for Innovation performance.

Future Scope

Further research is required for aligning specific organisation-level strategic intent with expected Innovation Outcomes. Further research can be conducted to develop a score card, using definitive measures emerging from this study, for various innovative activities. Further research is required to measure actual performance measures for capabilities portfolio. More research is required to find out how Post academic research (PAR) can be encouraged at the national level. The study needs to be extended for all important industries for verification of the results. Typical to the processes of specific industry the capabilities and Framework may be modified from generic to specific measurement models

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1 Introduction

"Innovation is the transformation of knowledge into new products, processes, and services that involve more than just science and technology. It involves discerning and meeting the needs of the customers."

-Porter and Stern (1999)

1.1 Introduction to the background of the study

Innovation is a creative idea. This creative idea is developed and transformed to get novelty in form of a product, process, service, or business concept. These can also be combinations that have been activated in the marketplace for improved business performance, for yielding new profits, and offer growth for the business. The business environment is competitive and hence innovation is essential for growth and survival. Thus business organizational ecosystem is primed towards ceaseless insights for development and sustained innovation. (Reinhardt & Gurtner, 2015; Romer, 1990; Schumpeter J., Lhomme, et al., 1942).

Economies grow well with consistently high levels of innovations. Innovation helps drives economic growth. It involves activity to create economic value. Since Innovation is an abstract concept the insights are often difficult to attain. (Bosworth & Collins, 2007; Caggese, 2019; Grabner et al., 2018). *Knowledge* aids as an input for innovation development. It is applied to create new areas of knowledge or it can be a combination of existing knowledge. "Innovation involves the combination of inputs in the creation of outputs, which is a complex process that is not easily reduced to measurable elements" (N. Anderson et al., 2014; Gracioli et al., 2013; Nahapiet & Ghoshal, 1998). *Sustained Competitive advantage* requires distinct capabilities. The seminal work by Barney elucidated characteristics of differentiating capability as Value, Rareness, non-imitability, and Substitutability. If a business implements such capabilities it will be able to leverage competitive advantage (J. Barney et al., 2001; Eisenhardt & Martin, 2000; Siguaw, 2006, Müller, 2019, Bocken, 2020). These capabilities are the enablers of Innovation. *Strategy* to endorse Innovation considers several factors. A few important factors are the ability to leverage innovation for competitive advantage, unpredictable outcomes and

insights that not easily discoverable during the stages of research, development, and commercialization (Michael E. Porter, 1983, 1994, Grant, R.M. 1996).

Innovation framework that concentrates the enablers of capabilities, needs its inputs having *structural resilience,* for a business. this can be as a set of capabilities as a portfolio for Innovation activities to achieve Innovation. (Börjesson et al., 2014; J. L. Chen, 2012; Hullova et al., 2019; Jong et al., 2013; Teece, David J., Pisano, Gary, Shuen, 1997). *The innovation performance* is the outcome that is achieved from Innovation activities carried out with acquired capabilities that are established for the Innovation outcome to be successful. These require knowledge and learning as inputs. Innovation outcome is in stages of creation and delivery (Bessant et al., 2014; Ganguly et al., 2019; Jong et al., 2013; Smith et al., 2019).

1.2 Industry-independent comprehension

During the Industrial Era, the convergence of resources and strategy was already seen for the manufacturing industry studies (Rosenberg 1963). As the industries progress, into the future, the question arises; Does the focus remain the same if the components of business vary for the industries of the future?

The generalizability of the resource and management of innovation is industry independent as emerged in various studies (Flynn, Schroeder, and Sakakibara 1994; Hacklin and Wallin 2013)(Flynn, Schroeder, and Sakakibara 1994). Thus, providing a perspective to examine technological convergence witnesses that the phenomenon is pronounced for the firms competing in fast-changing environments. They exhibit a high level of interlinkages for learning and development (Lei and Slocum 1992). Sustaining the competitive advantage with building knowledge management techniques, skill development, and learning and insights is necessary (Constance E. Helfat and Margaret A. Peteraf 2003; Eisenhardt 1989; Nonaka 1994; Teece, Pisano, and Shuen 1997).

The studies have been discreet for studying the innovation trajectories, these are done during phases like the growth stages, or maturity or hype stages, lacking to have a comprehensive view that gives an understanding of the integrated and comprehensive view of the trajectories for the future. Even in hindsight, it can help in developing the process for studies in maturity and these can help in transference for the new and emerging innovation capability that may be predicted for better management for capability oriented predictive management modeling.

1.3 Innovation in Indian Context

In the Indian context, where India is a developing country, needs strength derived from a strong Innovation posture for economic development and growth The Indian context is not completely out of gear for Innovation but more insights are needed, drawn from in-depth studies to find the right aspects for strengthening the pillars that support the development in Innovation. There exists a need for better Innovation management at the national level to manage various aspects and functions that support Innovation, need development within Industries, regulating institutions, and supporting institutions. It is essential to understand key enablers that will help the transition in maturity for a developing country, especially about innovation capability (Panda & Rath, 2018, Xavier, 2017).

Financing initiatives are a challenge and concern, for Innovation for start-ups as well as running businesses. They require a nurturing innovation eco-system, as the availability of financial avenues, business incubation supporting centres, and venture capital. From research studies, it is realized that the vision to indoctrinate Innovation scarcely any companies have a proper strategy to see them through. And so, revenue in R&D becomes the primary issue to facilitate the financing ability, a serious concern. In India, there is an inclusive innovation through social entrepreneurs is currently booming but these growth in entrepreneurial ventures and but it hurt by from a lack of finance. The study by Tomar, (2016) discusses the possibility of emerging alternative in management of financing that is steadily emerging to assist these ventures. This forming innovation eco-system of support for inclusive innovation and social entrepreneurship may help development. (Bosworth et al., 2007; Sonne, 2012; Tomer, 2016).

A stimulus to engage in Innovation activities, for capabilities development such that the interest and incentives to achieve innovation and keep at it, is required as an attitude. At the national level and Industry level this inducement results as R&D, enhanced in terms of contribution needs to increase for expenditure and outcomes twofold within the next fifteen years as a roadmap by the Indian government reports (Tomer, 2016, DSIR Report 2017). The innovation in the various industries with the understanding and differentiation in requirements say at the component level will hold insights for enhancements. And present state of affairs, at the global level of competition, maybe compared as a benchmark, for IP, trademarks, and design as seen globally.

In the World ranking, the report by "The World Intellectual Property Organization Report" (WIPO, 2019) shows that India stands 48th ranked, with 50,000 (In 2108) Intellectual Property rights (IPR) granted. But many more were filed, and 66% of the total were withdrawn or abandoned, as the highest number. As this is compared to other countries, withdrawals are near negligible and rejections are below 10%. This is a cause of concern for India. Once again it is imperative to reduce rejections, withdrawals and increase the number of Innovations filed. India requires a structured approach to the management of innovation, not as an individual pursuit but as an economic archetype with the measurement as a systematic method. Looking at the deeper insights into the industries and the spending involvement is depicted in the table where Industries engaged in Innovation by the Sector share of R&D spending is seen for India as well as the aggregated global trend. The sectors seen are Pharma, Auto Industry, Oil & Gas and Software and Computer Services as the major ones for India, while it deviates from the global in Technology and Hardware equipment as a leading area.

Table 1: Patents granted by WIPO offices worldwide (Source WIPO Report 2019)

Patents	2017	2018	Growth rate (%)	Share of world total (%)
Applications worldwide	**3,162,300**	**3,326,300**	**5.2**	**100.0**
China	1,381,594	1,542,002	11.6	46.4
U.S.	606,956	597,141	–1.6	18.0
Japan	318,481	313,567	–1.5	9.4

Table 2: Withdrawn & Abandoned IPR-. India with withdrawn applications of 66%.

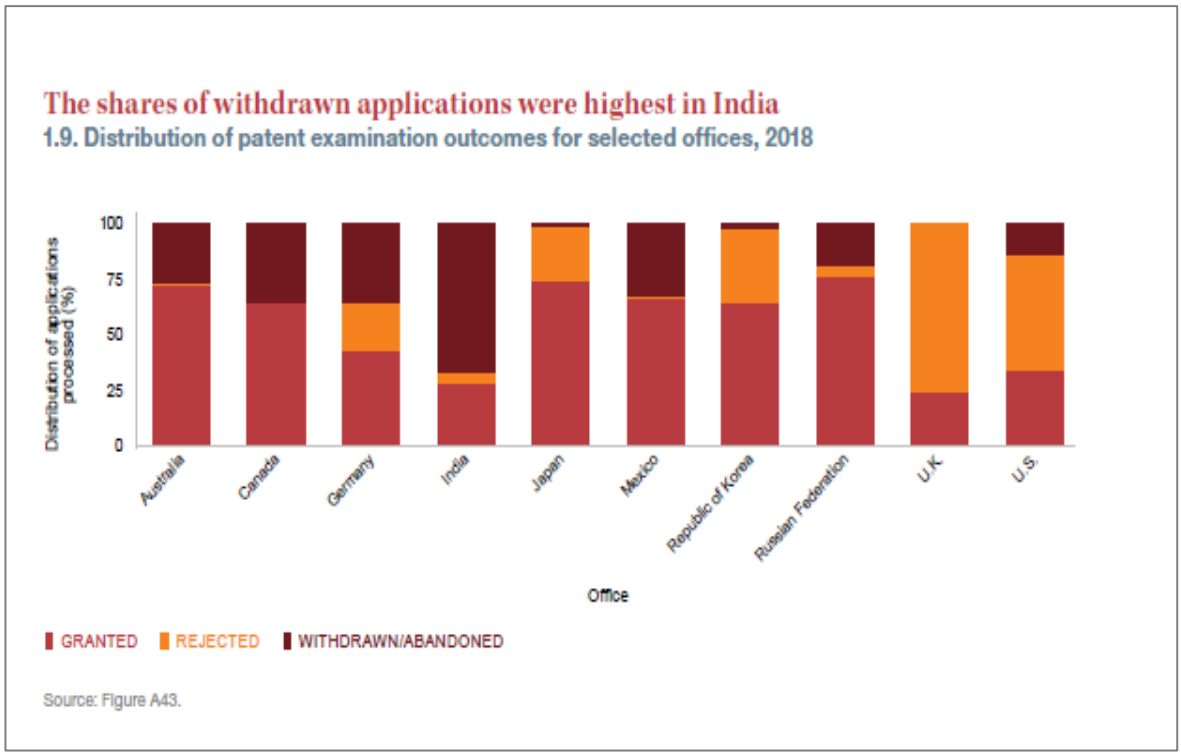
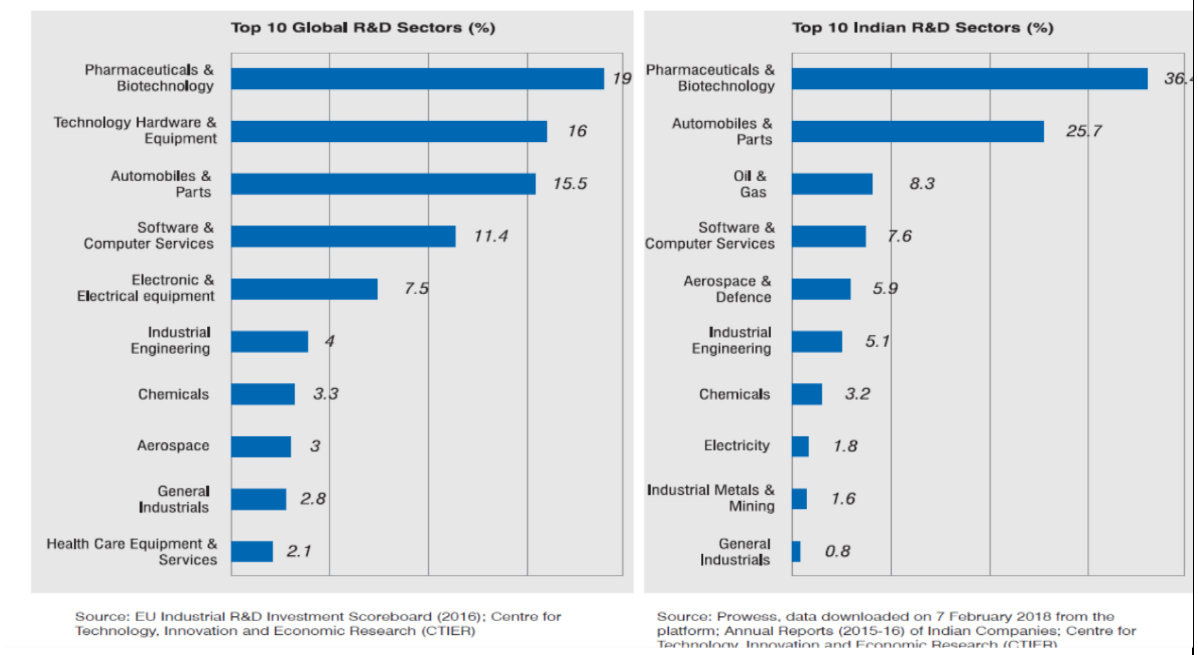


Table 3:Comparison of the Structure of Global and Indian Industrial R&D Spending.


3.4.1 | Comparison of the Structure of Global and Indian Industrial R&D (Sector Share of Total Industrial R&D Spending)
Top 10 Global R&D Sectors (%)
Pharmaceuticals & Biotechnology 19
Technology Hardware & Equipment 16
Automobiles & Parts 15.5
Software & Computer Services 11.4
Electronic & Electrical equipment 7.5
Industrial Engineering 4
Chemicals 3.3
Aerospace 3
General Industrials 2.8
Health Care Equipment & Services 2.1
Source: EU Industrial R&D Investment Scoreboard (2016); Centre for Technology, Innovation and Economic Research (CTIER)
Top 10 Indian R&D Sectors (%)
Pharmaceuticals & Biotechnology 36.4
Automobiles & Parts 25.7
Oil & Gas 8.3
Software & Computer Services 7.6
Aerospace & Defence 5.9
Industrial Engineering 5.1
Chemicals 3.2
Electricity 1.8
Industrial Metals & Mining 1.6
General Industrials 0.8
Source: Prowess, data downloaded on 7 February 2018 from the platform; Annual Reports (2015-16) of Indian Companies; Centre for Technology, Innovation and Economic Research (CTIER)

(Source: CTIER 2017)

1.4 Rationale

The challenge lies in the fact that the insight to understand Innovation, its enablers, and the capability to leverage knowledge is a critical task. *For Measurement* of Capabilities for innovation, are intangible assets, they present a different set of challenges to leverage, develop, and commercialize. To be able to harness the aspects of Innovation, it needs measurement, bringing up a difficult issue in context. Measuring intangible assets directly is difficult and even the existing methods that exist have their perspectives for these measures and hence there are no standardized methods.

At the Managerial level for control, within the process and management of innovation, it would be necessary that they have insights into the interactions, linkages, and appropriate measurement methods. And to achieve maturity in Innovation practices, the process needs to be institutionalized and followed within organizations as a framework. *And within the Indian context*, which has a higher gravity of obstacles than the benchmarked counties for Innovation. The R&D Spending is much lower than the other countries comparatively. And world ranking has lower IP granted which would be acceptable but abandoned applications point to the direction that there is distinct underperformance that needs focus. And that there is a certain regime to practice innovation needs stimulus.

The individuals involved in the business activity and have the potential to innovate are an important aspect for awareness and change of mindset is towards the employees of the company involved in value chain activities will be predominantly needed to be aware and create an eco-system. (Subdbo, 2000, Wang 2020). Hence in what way they recognize and perceive Innovation capabilities within companies, especially Large-scale Indian companies.

The Large-scale companies will have systems and processes well documented. The empirical validation for perception is investigating the enablers on the Innovation performance. The perception of innovation is important. The Framework for measurement of Innovation is missing or ill-equipped in many companies for Innovation success. If a comparative line is drawn to the NASA for particular technology has processes in the form of Technology Readiness Levels (TRL). This aspect with STI needs firm policy standard for measurement of Innovation in the National Innovation survey of India (STICK and Raghuvanshi, Agrawal,& Ghosh, P. K., 2019).

In adequate compliance in Integrating, Reporting and Management of authorized Data Centres with issues in comparing data about investment in R&D as data reporting is inconsistent for

India's data and data reported by others about India (Barth et al., 2015). The international processes as laid down in the OECD report for research statistics according to the Frascati Manual are standardized. The Ecosystems for management of "Post Academic research" (PAR) in the field of applied research, for policy decision and action for Policy and procedures, Managing Institutions and Regulators needs to have a clear action plan to ensure that investment in research results in economic growth. (Raghuvanshi, J., Agrawal, R., & Ghosh, P. K., 2019, Ustyuzhantseva, O. V. 2015).

Lack of identification of indicators in early stages of innovation, as a result, this study is to have an overview of, what needs to be a framework for successful innovation performance, for detection of early stages into Innovation which is otherwise evasive. (Noblet, 2011, Watts, 2001, Evanschitzky, 2012). Companies fall short on managing innovation. Many do not have resources or vision to support start to finish innovation process and a robust monitoring system which can make a difference between success and failure.

A Report by Nielsen on "Innovation Success in India" 2013 shows that the biggest barriers that are a hindrance for companies for the survey taken were that only 25% of Ideas are generated internally and adopted by 20% of Companies in the survey, only 5% of Revenue is spent on R&D for 32% Companies in the survey, Feedback from retailers/ partners taken only by 5% Companies and rushed decision for a failure of Innovation by 46% Companies (FMCG) within 12 Months of the launch. These parameters show that in India Innovation has several deterrents.

For its study, the challenges are in the area of the state of practice of innovation measurement. In select industries, it may be observed as a dominant trait within the Indian context as for the scope of this study. The third important issue is to identify the people's perception of enablers of Innovation for their capabilities, and operations within the framework given by the company.

Problem statement.

1. *What are the enablers of Innovation in an Organisation?*
2. *How are Innovation and Innovation enablers perceived within an Organisation?*
3. *To what extent are the set enablers of Innovation as Innovation framework that have significant influence and are support to Innovation performance?*

1.5 Scope of the study

2 Review of Literature

The *Literature review sources* were Web of Science, Scopus, ProQuest, Jstor, Science Direct, Emerald Insights and Ebsco databases with the Journals used were 80% A & A* category, the rest from B & C. Well-cited papers and relevant papers were used. The categorization was used ABDC journal listing and Scimago Journal & Country Rank for the first run of Systematic Literature Review, where the references from Government Publications & Reports were about 150 nos., Relevant Research Articles Searched were about 495 Nos., using six software tools. The next phase was reviewed articles as Integrative Literature Review gave about relevant Resources Reviewed of about 156 papers.

The outline of the literature review is in the following parts.

1. Study of "Perception of Innovation" as a Concept
2. Defining and operational definition for Innovation Activity.
    a. Human Intellectual Capital (HC).
    b. Organizational Structural Capital (STR)
    c. Relational & Networking Capital (REL),
    d. Innovation Value Chain (IVC)
3. Framework and Measurement Tool for Innovation Activity (IA)
4. Defining and operational definition for Absorptive Capacity (AC)
5. Defining and operational definition Organizational Innovation Performance as Innovation Success Indicators (PER).

2.1 Study of "Innovation" as a Concept

The study has a focus that is for "Understanding the Concept of Innovation" with features, characteristics with relevant theories. The objectives of the study are to identify the components perceived to innovate.

Table 4: Emphasised characteristics of Innovation studies

"Emphasized characteristics of Innovation studies

Author(s)	**Emphasis**	**Reasons**
Rogers (1962)	Diffusion of Innovation	Diffusion of Innovation

Hall, G. E., Loucks, et al., (1975).	Levels of use of the innovation	A framework for analyzing innovation adoption.
Imai et al. (1985)	Functional Integration Electronic data processing	Integrated innovation process
Garvin, D.A. (1993)	Building a learning organization.	Constituents for Learning in an Organisation
Rothwell (1994)	Needs	Information assurance of the innovation process
Frambach, R. T., & Schillewaert, N. (2002).	Organizational innovation adoption	Adoption study
Chesbrough (2003)	Level of openness	Bounded (closed) Unbounded (open)
Oke, A. (2004)	Barriers to innovation	Study of barriers in Service
Wan, D., Ong, C.H., Lee, F.	Determinants of innovation	Study of enablers of innovation
Subramaniam, M., & Youndt, M. A. (2005)	Intellectual capital and capabilities	Study of the influence of intellectual capital on the types of innovative capabilities
Woolthuis, R. K., Lankhuizen, M., & Gilsing, V. (2005).	system failure framework	Policymaking - understanding the failure aspects
Dvorak et al. (2006)	Feedback & Creative activity	Cross-connection of the innovation process
Bernstein & Singh (2006)	Manifestation of management	Innovation process for site management
Siguaw., Simpson, P.M., Enz, C.A.(2006)	Innovation orientation:	Conceptualizing a framework for study and integration of innovation research
Hekkert, M. P., Suurs (2007)	Functions of Innovation systems	Study of systems and an approach for analyzing technological change
A Stone, S Rose, B Lal, S Shipp (2008)	Measuring innovation	enablers of Innovation -Constituents and for measurement as a framework
Chen, Y. S (2008).	Green Innovation	The driver of green innovation and green image–green core competence.
Al-Debei, M. M., & Avison, D. (2010)	Developing a unified framework	Business Modelling
Fariborz Damanpour (2010) (1996)	Factors affecting Innovation	An Integration of Research Findings of Effects of Size, Competition on Product and Process Innovations
Mol & Birkinshaw (2006), Vlcek (2011),	Dissatisfaction with -status quo	Needs I dissatisfaction as the main launcher
Govindarajan, V., & Euchner, J. (2012).	Reverse innovation.	developed as inexpensive models to meet the needs of developing nations
Stilgoe, J., Owen, et al, (2013)	Responsible Innovation	Developing a framework for responsible innovation
Anderson, N., Potočnik, K., Zhou, J. (2014)	Innovation and Creativity in Organizations	A State-of-the-Science Review, Prospective Commentary, and Guiding Framework
Kim, M., Song, J., & Triche, J. (2014)	Integrated framework for the Innovation process	The study using the resource-based view and dynamic capabilities approach.
Barrett, Davidson, Prabhu, et al (2015)	Innovation in the Digital Age.	Service Innovation aspects & Key Contributions and Future Directions
Hartono, A. (2015)	capability-based framework	new ideas & capability-based framework for innovation
Lendel, V., Hittmár, Š., & Siantová, E. (2015).	Managing Innovation	Management of innovation processes in an Organisation
Cassol, A., Gonçalo, C. R., & Ruas, R. L. (2016).	Framework for intellectual capital and innovation	Redefining the relationship between intellectual capital and innovation and Absorptive capacity
Fariborz Damanpour (2017)	Organizational Innovation	Constituents and environment for innovation as a framework
Ferasso, M., Wunsch (2018)	Innovation ecosystems: a meta-synthesis	Ecosystem for Innovation and essentials
Raffaelli, R., Glynn, M.A., Tushman, M. (2019)	Adoption and cognitive frame	The role of cognitive and emotional framing in innovation adoption by incumbent firms"

2.2 Definition of Innovation

These are several studies that define Innovation as a concept and bring forth important aspects that need to be considered as well.

The study of innovation is vast and the works of literature across disciplines as sociology, education, management, etc. Findings by Subramanian and Nilakanta (1996), in areas of organizational theory and strategic management are about Innovation management. The contrast is in those interested in understanding the causes of innovative behavior of consumers and the larger view with strategy.

From several definitions of Innovation a few are selected for discussion and two are adopted for this study.

Damanpour (1991) defines innovation from an organizational perspective: "Innovation is the adoption of an idea or behavior, whether a system, policy, program, device, process, product or service, that is new to the adopting organization"

And the Second definition considered is:

Porter and Stern (1999, p. 12) define innovation as "Innovation is the transformation of knowledge into new products, processes, and services — involves more than just science and technology. It involves discerning and meeting the needs of the customers."

From other studies, the views about innovation are about are enabling capabilities for make or producing new products and processes as unceasing in improvement (Dougherty & Hardy, 1996). The knowledge that is leveraged for a new product or service to customers is such that its value is created for lesser costs or for improved attributes (Afuah, 1998). These improvements are either of a product or process nature is not distinguished. Similarly, a radical or incremental nature is also not foreseen before attempting. Incremental innovations are continuous efforts with improvements in products or processes demand. (Jha et al.,1996) this goes with the collection of activities for better performance improvement.

Innovations ranging from most frequented as the technology to all other types of Innovation are dependent on leveraging the opportunity. This deciphers that an enterprise systematizes an organization set up in terms of administrative, management, and structural setup for the processes, strategies, and benchmarks setup as capabilities management with the given resources. Within knowledgebase of Innovation studies for these challenges and shortcomings are for specific business patterns, undefined typology, attributes of management which are complex in nature, and so their measurement is difficult, uncertainty and methodological are challenges for the management of innovation studies (Damanpour, 2014).

Innovation helps drive of economic growth. It is of interest to understand the significant competitive advantages and with fostering innovation, exploit innovation capabilities for economic growth (Stone et al., 2008).

The importance of Innovation and its related organization's success is conquered by researchers and businesses but, identifying the delivery and how it can be achieved has differences and there is little consensus regarding its compositional facets. Identifying the fundamental concepts discussed by Al Debei (Al-Debei & Avison, 2010) in their reasoning shows the hierarchical nomenclature of the Business Models is comprehensive with four fundamental aspects as constituent elements, modeling principles, its interactions, and intersections with foundation pillars as the strategic intent, business processes orientation.

Research studies have defined Innovation with variation in their perspectives. The following section discusses and argues for its merit and suitability for this study as the definitions of innovation by various studies.

Innovation is "may involve a wide range of different types of change depending on the organization's resources, capabilities, strategies, and requirements" (Baregheh et al., 2009, p. 1324). "Innovation has many perspectives and disciplines; therefore, it does not conform to a single definition or measure of innovation. Indeed, the term 'innovation' is notoriously ambiguous and lacks either a single definition or measure and define Innovation as 'the successful exploitation of new ideas, to guide our review, because it accommodates the range of innovation types as product or service, process, administrative, technological, many more." (Adams et al., 2006). "The word Innovation brings in novelty as the emphasis of most innovation definition" (Goswami & Mathew, 2005) is a generic definition. "Schumpeter in the 1930s defined five types of innovation such as Introduction of a new product or a qualitative change in an existing product; Process innovation new to an industry; Opening of a new market; Development of new sources of supply of raw material; and Other inputs and changes in the industrial organization"

Damanpour (1991, p.556) defined innovation as "the generation, development, and implementation of new ideas or behaviors" and further elaborates on the premise of the innovation.

"Management innovation is primarily an organizational-level phenomenon" (Damanpour, 1991, Damanpour, 2014), this definition has elaborated on the environment of Innovation inclusively. Nohria & Gulati (1996, p. 1251) defined it to include "any policy, structure, policy,

method or process, product or market opportunity that the manager of the innovating unit perceived to be new". Wallin & Krogh (2010) hold a different perspective about innovation differently and they defined innovation for creation and management of knowledge assets. The relation between the newness and its contribution to value creation is defined here. It integrates knowledge and aspects of innovation (Wallin & Krogh, 2010), this definition discusses integration which gives wider scope and understanding of the phenomenon (Wallin & Krogh, 2010, p. 145).

Bercovits & Feldman (2007) states innovation's ability to create economic value from new ideas. The idea is abstract and it operationalizes to actual functional prototype is an important aspect. This further establishes the definition for instance ideas, business process or service, enablers within Innovation framework and competencies, economic value. "A multidimensional knowledge structure composed of learning philosophy, strategic direction, and trans functional beliefs that, in turn, guide and direct all organizational strategies and actions, including those embedded in the formal and informal systems, behaviors, competencies, and processes of the firm to promote innovative thinking and facilitate successful development, evolution, and execution of innovations." (Siguaw, 2006)

In the study by Carayannis, the review of the literature has analyzed twenty-one empirical studies which focus on aspects of innovation that can be contrasting bringing out the nature that might make a difference during innovations as administrative versus technical (Daft, 1978), the actual on-ground aspects with both "process versus product innovation" (Utterback and Abernathy, 1975), with the business the differentiating issues for sustain Innovation with "incremental versus radical innovation" (Henderson and Clark, 1990), and "evolutionary versus revolutionary innovation"(Utterback, 1996). Innovativeness is a striking feature of key success factors for performance. (Christensen et al., 1998; Jansen et al., 2006). (Carayannis, 2008).

Innovation begins from creativity to the development of Ideas into Innovation, which is an integrative approach. Creativity is the beginning stage of idea generation, while innovation implementation is the completion of the process (N. Anderson et al., 2014). Anderson et al have discussed in-depth the from individual, teams, and at Organizational level for creativity and innovation. Leadership is an important aspect to nurture Innovation in an organization. Although leaders have a significant impact on innovation activities, they work with people and teams are the stimulants and need to interact with the contingency factors for innovation results

to take place. And there is no definite knowledge of the mechanism that the leaders' Perception in the process of Innovation as more or lesser than other stakeholders (Denti and Hemlin 2012). The variety in the leadership and the causes that mediate and moderate the outcome of innovation is ambiguous.

2.3 Evolution of Innovation studies

The generations of "Innovation studies" have evolved to "process indicators" as the level of studies (Alavi & Leidner, 2001; Milbergs & Vonortas, 2004), are part of this Innovation study. Based on the process of innovation at the organizational level (Conner, 1991). We have identified the gap, that to study the innovation enablers at the organizational level.

From the studies of Innovation (by Vogel & Harrington 2019), The resources from static resource-based view theory become dynamic Knowledge-based view. From the generation fifth onwards the stakeholder insights, collaborative efforts with strategic orientations are seen.

2.4 Typology

The type of innovation can be discussed depending on Nature, magnitude, occurrence, disruption within markets. Here we have discussed the pertinent ones for this study.

2.4.1 Magnitude -Radical and Incremental Innovation

Process and resources for radical and incremental Innovation have been studied by various researchers. Two important differences and implications that can be drawn are that

(i) Radical Innovation there needs to be more Knowledge management, dissemination, and development practices within the organization. This requires dedicated attention while incremental innovation happens with smaller requirements related to a customer's immediate needs. Radical innovation is a risky proposition and needs decision-taking aspects to be considered seriously for business. (Caggese, 2019; Engen & Elisabeth Holen, 2014; Ettlie et al., 1984).

(ii) Another important aspect of several other studies is that they have studied the enablers of innovation irrespective of the type (Dumay, 2013. Damanpour, 2017). The configuration can have continuum which may be continuous or discontinuous, such that it can consider innovation from incremental to radical and similar attributes (Carayannis et al., 2003, Dumay, 2013).

(iii) Disruptive Innovation is a break-in system of working throughout the industry. It is a type of radical innovation but it disrupts the functioning of a newer method with the effects felt in adoption in the markets. With the pace of technology adoption where the change is rapid, one finds the concept of disruptive innovation (Christensen, 1997).

2.4.2 Nature. Product & Business Process innovation

Product and Service Innovation has been separated but for this research, it is important to have the capability which is generic for an industry.

It was in the earlier studies that innovation was product, service, organization, and market innovation. But since the distinction does not stand anymore. From the OECD Oslo Manual 2018, definition, there are only two main types with character as;

"An innovation is a new or improved product or process (or a combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process) with a major consideration in revising the definition of business innovation was the decision, based on cognitive testing work, to reduce the complexity of the previous list-based definition, and now it is only two main types (i)Product innovations -Product innovation is a new or improved good or service that differs significantly from the firm's previous goods or services and that has been introduced on the market (ii)Business process innovations. (ii) Business innovation is a new or improved product or business process (or a combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm. The revised definition also reduces the ambiguity of the requirement for a significant change by comparing both new and improved innovations to the firm's existing products or business processes".

The character of Innovation has the duality of "innovation" as a process and as an outcome by providing separate definitions for both concepts:

"Innovation activities include all developmental, financial, and commercial activities undertaken by a firm that is intended to result in innovation for the firm. Business innovation activities comprise of R&D activities, Engineering, design, and other, Creative work activities, Marketing, and Brand equity activities, Intellectual property (IP) related activities, Employee training activities, Software development and Database activities, Activities relating to the acquisition or lease of tangible assets and Innovation management activities are major areas for Business innovation activities comprise of R&D activities, engineering, design, and other

creative work activities, marketing, and brand equity activities, intellectual property (IP) related activities, employee training activities, software development and database activities, activities relating to the acquisition or lease of tangible assets and innovation management activities are major areas for Innovation activities".

"Business innovation capabilities comprise of the resources controlled by a firm, the general management capabilities of a firm, the skills of the workforce and how a firm manages its human resources, the ability to design, develop and adopt technological tools and data resources, with the latter providing an increasingly important source of information for innovation. Objectives and outcomes of business innovation, are done during the planning and development stage for innovation, this includes the identification of a set of one or more objectives that the innovation is expected to achieve". (OECD Oslo Manual 2018)

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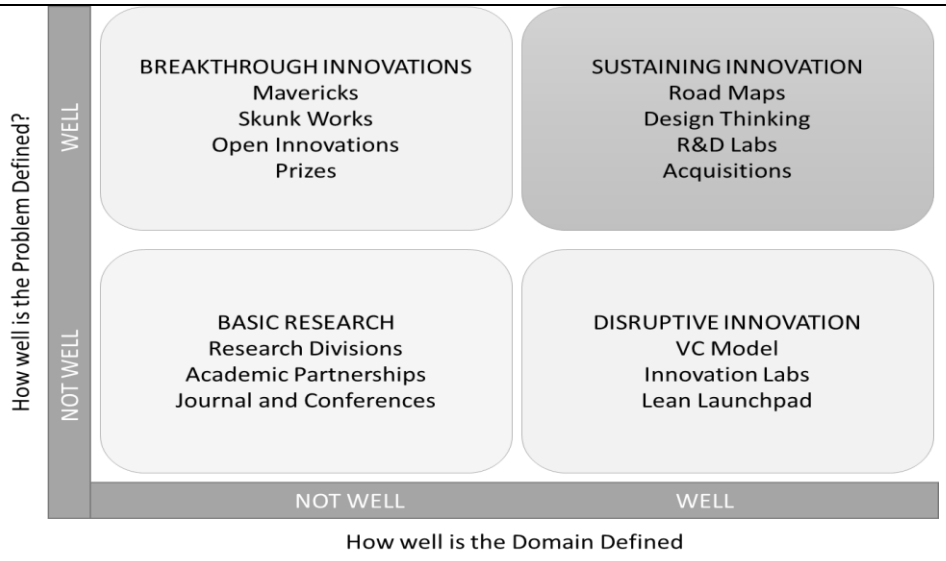
This research is about the effects of innovation and outcomes must be done using administrative data to identify the effect of innovation through econometric analysis (OEDC Oslo Manual, 2018).



(The figure is adapted from Satell, G, 2017)

Table 5:Type of Innovation: Domain Vs Definition Source (Satell, 2017)

The types of Innovation characters

"Sustaining innovation. happens with the vision and trials so the innovating teams already know as most of the time what they are seeking to get better at what we're already doing by improve existing capabilities in existing markets, and have a clear idea of what problems need to be solved and what skill domains are required to solve them. For these types of problems, conventional strategies like strategic roadmap ping, traditional R&D labs, and using acquisitions to bring new resources and skillsets into the organization are usually effective".

2.4.3 Captive and Open Innovation

The Open Innovation as stated by Henry Chesbrough's pioneering book (Chesbrough, 2003). He corroborated with the literature for traditional model of 'closed innovation' as the R & D efforts within Organisations with its limitations versus progressively firms reaching for external sources within the stakeholder community.

Chesbrough states that "knowledge is fluid, flowing into and out of organizations" and further categorizes "Open Innovation in two, namely, (i) Outside-in Open Innovation (knowledge, technology and other intellectual assets flowing into the organization from external actors) and (ii) Inside-out Open Innovation (knowledge, technology, IP/patents, etc. venturing out of the organization for commercialization and profits)" (Chesbrough, 2003).

Organisational Innovation as the Captive or Closed Innovation is within the Organisations, is for conserving Intellectual assets. Due to the threat and not the strategic intent of collaborative efforts the organization needs to conserve the intellectual property. This happens in case of protection of IP as in the case of pharma companies where the definition of sharing becomes very difficult to break up in terms of discoveries and creativity and its usages at the end of the research initiative(Den Hartigh et al., 2016; Smith et al., 2019).

2.4.4 Research and Innovation

Ernst's definition perspective was that of a process view of the complete innovation process cycle. "The process cycle would have research or invention for product development and production, marketing, and sales". Further this can be distinguished as "Certain types of innovation outcomes are associated with each phase. as, patent outputs are associated with the initial stages, such as basic research and invention, whereas sales of innovative products are usually an indication of innovation outputs during the commercialization stage of production, marketing and sales. This brings about the distinction in the Process of Innovation and Research" (Khilji, Mrockowski & Bernstein, 2006).

2.5 Innovation Framework

Innovation framework is an essential supporting structure of resources and processes that aid innovation and innovation activity.

The framework consists of the enablers of innovation. There are various perspectives on the development of the framework. Value-added Corporate innovation framework, where the business base with the attributes needed for creating value are considered (Mario Gomes Augustoa, 2014). Another perspective is to look for an outcome and risk by managing reflexivity, Anticipation, Inclusion, and Responsiveness (Stilgoe et al., 2013). Several other studies study the organizational capitals as the human resource capital, Organizational structures, Functioning (Glor, 2014; Mario Gomes Augustoa, 2014; Şimşit et al., 2014; Svanadze & Kowalewska, 2015a). Some studies look at the dynamics of the processes and propensity (E. G. Carayannis et al., 2018; Mario Gomes Augustoa, 2014; Zhou, 2017).

From the Knowledge-based view, the function of the framework is to assist in the capacity building and aid the organization to perform for sustained competencies by the way of innovating and creating value.

Table 6: Innovation framework Studies

	"Author(s)	*Review of central Idea*
1	(D. H. C. Chen et al., 2005)	Introduces the **knowledge economy framework**, which asserts that sustained investments in education, innovation, information, and communication technologies. *relationships among strategic capabilities, innovation, intensity, and firm performance* It is for Index for regional studies.
2	(I. P. Anderson et al., 2008)	Creativity research has typically examined the stage of idea generation, whereas innovation studies have commonly also included the latter phase of idea implementation. With **comprehensive levels-of-analysis framework to review extant research into the individual, team, organizational**, and multilevel innovation.
3	(Teece, David J., Pisano, Gary, Shuen, 1997; David J. Teece, 2007)	The **dynamic capabilities framework** analyses the sources and methods by private enterprise firms operating in environments of rapid technological change
4	(Glor, 2014)	The framework identifies definitions of innovation suitable for each approach, what each approach is **most suited to studying, their levels of analysis, suitable methodologies and measures**, and the types of impacts each is capable of revealing with Organisation communities.
5	(R Fernandez, J Harrington & F Voehl, 2019, pp 276))	The best-practice **innovation framework** Should be useful to all types of organizations, large and small, public and private, and must necessarily address and organize a very broad range of issues, discussion of a masterplan and seven methods are discussed
6	(Hekkert et al., 2007)	Proposed a **framework focuses on high importance for well-performing innovation systems**, as functions of innovation systems. Systematically mapping those processes taking place in innovation systems and resulting in technological change. For sustainable technology development.

7	(Frambach & Schillewaert, 2002)	The **framework** that we propose addresses the adoption decision at two levels, i.e. The organizational level and the individual adopter within an organization. We integrate research on innovation adoption and technology acceptance that have emerged in the marketing and management literature and identify several research issues that need further attention.
8	(Siguaw et al., 2006)	Develops **a comprehensive, organized framework for understanding innovation orientation** and its effects. In doing this, the framework extends the **dynamic capabilities research stream by explaining** how innovation orientation fosters the development of organizational competencies and makes it possible for a firm to recognize and respond to shifts in market dynamism
9	(Knickel et al., 2009)	Discuss a conceptual **framework that understands innovation processes** as the outcome of collaborative networks- information is exchanged and learning with technical and economic factors used to analyze drivers and barriers. Further, institutional aspects of cross-sector as well as intra-sector processes are explored for innovation functions. They emphasize that institutions, administrations, and extension services, whose mission is to support changes, can become barriers to innovation.
10	(Santos, J., Zawislak, P., Franzoni, G., & Vieira, 2015)	The aim is to use a **bibliometrics approach to map** out the authors, institutions, journals, and the evolution of the publication as well, to provide the path needed to build a **theoretical framework** for a study **on innovation and technological capabilities**
11	(Şimşit et al., 2014)	This **framework starts with the need or problem definition and outlines different techniques** to evolve the ideas. Innovation management process tools are simplified complex problems and reveal the core problem with possible solutions, and the engineering team gathered and performed idea generation and developing meetings to find the best solutions using the TRIZ method.
12	(Ma´rio Gomes Augustoa, 2014)	Analysis's procedures were used to assess the impact on **organizational performance of innovation** for small and large organizations
13	(Stilgoe et al., 2013)	Explores the: anticipation, reflexivity, inclusion, and responsiveness.**4 dim integrated dimensions of responsible innovation**
14	(Svanadze & Kowalewska, 2015b)	Value-Added Intellectual Coefficient (VAIC) method **to measure intellectual capital** and the efficiency of its components by statistical analysis
15	(E. G. Carayannis et al., 2018)	Different innovation aspects are critical policy-wise and practice-wise as it provides a perspective on relative efficacies and potential ways and means to **calculate differential efficacies** for alternative configurations of resource allocations.
16	(Zhou, 2017)	**Dynamic capabilities by three distinct dimensions** (sensing capability, integration capability, and reconfiguration capability), facilitate different types of innovation that in turn improve firm performance.
17	**(Jong & Marston et al., 2013)**	The **framework of eight essentials of innovation** Strategic and organizational factors
18	(F. Wang & Chen, 2020)	Innovation **requires different patterns of organizational innovation**
19	**(Andrikopoulos, 2010)**	Analyses intellectual capital as a tool to meet practical needs concerning accounting for and managing knowledge-based, intangible wealth. Several explanations are provided on the extent of acceptance of intellectual capital as a management accounting alternative
20	**(Subramaniam, 2005)**	Organizational capital positively influenced incremental innovative capability, while human capital interacted with social capital to positively influence radical innovative capability. Counter to our expectations, however, **human capital by itself was negatively associated with radical innovative capability**

21	**(Hartono, 2015)**	This framework will be the pioneer that provides the following contribution such as the integration of new ideas and relevant a firm's capability, a wider range of internal and external new ideas sources and **types of innovation as the output of innovation activities**. The developed framework will be tested to measure innovation activities of the Indonesian firms from a wide range of size and types of industry background
22	**(Damanpour, 2017)**	The parameters are for environment and Innovation. Contextually focus is larger constituents & environment for innovation as a framework
23	**(Gracioli et al., 2013)**	Intellectual Capital: An Innovative Tool in the Search for Competitive Advantage. Review of Administration and Innovation
24	**(Roper et al., 2008; Roper & Arvanitis, 2012)**	This recursive process of knowledge sourcing, transformation, and exploitation comprises the innovation value chain. Modeling the innovation value chain highlights the drivers of innovation, productivity, and firm growth. These forms of knowledge sourcing also make a positive contribution to innovation in both products and processes although public knowledge sources (2008).; The innovation value chain (IVC) divides the innovation process into three separate links or activities: knowledge gathering, knowledge transformation, and knowledge exploitation (2012)
25	**(Cassol et al., 2016)**	Redefining the relationship between intellectual capital and innovation.
26	(Kalmuk & Acar, 2015)	The importance of mediating role of organizational learning capability on the relationship between innovation and company's performance with a strategic approach. It's tried to prove the contribution of more than one type of innovation to a company's performance through organizational learning capability. And ascertain if organizational learning capability is effective as an intermediate variable to the effects of innovation at company's performance
27	**Stoeckicht, I. P., & Soares, (2012)**	innovative capacity based on an analysis of their intellectual capital management practices, systems, and models. Using the Intellectual Capital Innovation Assessment Model®, this analysis was conducted on 19 intellectual-capital-related indicators considered important to the development of an organization's innovative capacity. The results point to a significant correlation between the companies´ capability to innovate and the intellectual capital management models they adopted"

The development of this study is taken with a different approach from similar studies – by introducing the Innovation value chain with intellectual capital. And the major reference framework referred are Damanpour (1996), Damanpour (2017), Andrikopoulos (2010), Stone (2008), Kim (2014), Hartono (2015), and Cassol (2016).

The Innovation framework is an essential supporting structure of resources and processes to aid innovation and innovation activity. This is an essential part of the development stages of institutionalized Innovative behaviors. The key areas of the framework functions are as follows, which are the basis for the component's assembly in their specific form, and Adapted from Voehl as stages given below (F Voehl, J Harrington, R Fernandez, 2019).

The key areas of the framework functions are as follows, which are the basis for the component's assembly in their specific form.

Stage 1 - Development of Framework Strategy Assessment

(Giving the Linkages, strength, and influence, for this study)

Stage 2 - State definition – future state

Stage 3 – Defining an Implementation Approach

Stage 4 – Execution with Development & implementation of the framework

Stage 5 - Operation and Sustain.

- *This Stages 1 and Stage 2 are incorporated in this study.*
- *As for Stage 3 & 4- Is recommended for application in the industry, when further areas are defined for identified specific organizational setup.*
- *And finally, Stage 5- Recommended for future studies and implementation.*

Voehl considers "*An innovation infrastructure master plan is only as good as your organization's ability to execute it, and your execution ability depends upon, for the most part, your innovation mind-set. The best-practice innovation framework should be useful to all types of organizations, large and small, public and private, and must necessarily address and organize a very broad range of issues, big-picture perspective of innovation strategy, down to the deep-down inner secrets of creative thought, along with everything in between*"

The framework for resources derives its orientation from Knowledge-Based View (KBV) which is vital and is closely linked to resources-based management (RBV) (Chou & Liu, 2013) The distinction in the application of KBV is that though Knowledge is also a resource, its treatment is different due to its dynamic nature. Knowledge-based resources are essential for enabler deployment. KBV is also considered as part of enablers of innovation within the framework as it aids in the development of capacity building in terms of skill, knowledge dissemination, and capabilities for creating value (Wernerfelt, 1984; Zhao, 2013) and as a supporting theory for Framework formation in this study.

An innovation framework as a substructure plan depends upon an organization's ability to execute under enablers of Innovation as capability, assumptions, methods, and notions held within the organization. The best-practice innovation framework should be useful to all types of organizations and issues - from broad range perspectives to in-depth requirements of Innovation. Innovation practice needs to be disciplined exercise. Organizations relying on one-off chances, serendipitous acts of creativity, taking an unstructured approach, or with poor implementation may only see incremental improvements at best. Strategic approach planning integrates value delivery as part of innovation practice. A strategic Innovation framework is

responsible for a portfolio of advanced business growth opportunities (Vohel, 2018) It is important to maintain a competitive advantage. to have "international activities like a portfolio will undermine the possibility of achieving a competitive advantage" (Porter, 1998). Within the Innovation framework established procedures for dynamic capabilities framework of competencies as a subsystem normally evolves (Rajapathirana & Hui, 2018; Siguaw, 2006; Van Lancker, Mondelaers, Wauters, Van Huylenbroeck, et al., 2016). The enterprise perspective in detail, which widely differs from an entrepreneurial perspective. This has to be proactive, identifiable, and customer-centric. The new areas that evolve in the knowledge space must have effective knowledge usage and learning capabilities for Innovation. The ecosystem essentially must have a viewpoint as owning assets internally and arranging the very useful in a flexible and adjusted manner will complete the deployment in Innovative capacities building.

2.6 Enablers of Innovation

It is studied under RBV and KBV for this research. A knowledge-based view has in the strategic management literature where it has been derived from the Resources based view. (Penrose, 1959), RBV (B. J. Barney, 2001, Wernerfelt 1984, Barney 1991, Conner 1991). As a significant observation that the knowledge-based capability plays a significant role in capability buildings (Alavi and Leidner 2001, Grant, 1996, Kim 2015).

Capability as an asset has (Leonard,1995) four dimensions of a core capability – physical systems, skills, managerial systems, and values. And three categories are a) Core, b) Enabling & c) Supplemental. Perspective for advantage is Differentiating Capability with special distinct & cannot be imitated easily. It can also be seen for competitive advantage as Dynamic Capabilities, where it can be -Sensing, mobilizing resources & transforming to align (Hartono, 2015, Susanty, 2019, Damanpour, 2018). Perception of capabilities under Organizational Studies has quantified organizational level traits by studying a set of employees who exhibit behavioral patterns. The behaviors exhibited by employees are the patterns exhibited as a phenomenon being studied within the Organization. (Thayer, 2007, Gunday et al., 2007; Maresch et al., 2016; Szabo et al., 2013), the unit of observation is the employees, is lower level than an organization (Kianto, 2016, Dawes, 2000; Tsai, 2002, Joseph L. Balloun, 2011).

Activities for the process of Capabilities is Innovation activity. It has four identified Innovation capabilities and one latent capacity. Human Intellectual Capital Organizational & Structure Capital, Relational, and Networking Capital. (Gracioli et all, 2013), and 4. Innovation value

chain (Roper et all, 2012). Absorptive Capacity - Realized capacities, Potential capacities of Organizational knowledge. Absorptive capacity is a dynamic capability because it is based on learning mechanisms under Knowledge management.

Innovation outcome is in the stage of Innovation is generated and later adopted. Innovation outcome during generation, created before dissemination (Rogers M., 1998; Watts & Porter, 1997). Innovation outcome to the diffusion of innovation or acceptance of innovation has a series of stages. There is a lack of indicators for the assessment in the early development stages (Evanschitzky et al., 2012; Santos et al., 2018).

2.7 Organizational Theory and Innovation

Organization theory about organizational design, relationships, and structures, this focuses on various dimensions of organization in terms of forms, specialization in organisation and standardization within. The theory that will aid the key objective to study the perception of Innovation and to analyze the factors affecting Innovation (Evanschitzky et al., 2012). The resource-based view or RBV (B. J. Barney, 2001) and knowledge-based view or KBV. Taking into consideration the Resource-based view basis of this study as the capability are the resources of the organization. Though Knowledge is a resource its treatment is different hence we consider the Knowledge-based theory for knowledge-based resources.

The knowledge-based theory has strategically significant resources like the Knowledge-based and its related intangible resources, and that it is socially complex, varied bases of knowledge and different levels of capabilities that evolve in firms to show that they achieve sustainable competitive advantage and performance. This knowledge exists in various forms and it moves through different entities of the organization as identity, policies, documents, systems, employees, and even the culture. The Knowledge-based view has in the strategic management literature where it has been derived from Resources based view to extend (Penrose, 1959) and further studied for depth (J. Barney, 1991; Conner, 1991; Wernerfelt, 1984). The primary differentiating reason to have the KBV is that the RBV does not deal with the dynamics of the resources that the knowledge base must consider and offer for the firms to be competitive and strategic. RBV statically treats knowledge while intelligence and special traits must be considered for knowledge-based capabilities. As a significant observation that the knowledge-based capability has information technologies, which play a significant role in capability buildings, which can synthesis and enhance the management of information rapidity within and

outside the organization (Alavi & Leidner, 2001) (Alavi and Leidner 2001). Since the Knowledge-based view is a pseudo view or not a theory of the firm informal sense (Grant, 2002, p. 135) hence we select the RBV and add the KBV for having the perspective see up for the study. So, drawing on the KBV and RBV, this study is about the strategic resources that influence the performance of an Organisation. This competitive advantage is gained by the assets that are valued, are rare, are difficult to emulate (J. Barney, 1991), and also hard to replace (Hitt, Bierman, Uhlenbruck, & Shimizu, 2006). The implementation of Knowledge sharing and exploitation practices are challenging (Mario Gomes Augustoa, 2014; Ray et al., 2004), but we assume that whichever the management style, the level of involvement, and driving the Knowledge-based View shows the knowledge management practices driven to influence the capabilities and organization Performance (Camisón-Haba et al., 2019; Singh et al., 2019).

2.8 Resource and Knowledge-Based View (RBV& KBV)

Innovation requires firms' perspective to be inward-looking and derive the imperative from an outward focus. Theories from the Resource-Based-View (RBV) of an organization and disparities in Knowledge-Based-View (KBV) of an organization make a difference in their competitive advantage. Kraaijenbrink et al (2010) quoted the argument of Barney (1991a, 1994, 2002) that "if a firm is to achieve a state of sustained competitive advantage, it must acquire and control valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities." Competitive advantage comes from the uniqueness of the resource or the configuration for control on the market (J. Barney et al., 2001). The competent and intellectually vibrant and skilful workforce is the key resource, is a driver. It can be argued that internal resources and capabilities are capabilities and are primary than to observe and positioning strategically as secondary focusing. The secondary focus would be the external environment with market intelligence such as information from the external environment, is available from competitors is in the open domain (Barney, 1986) as seminal and accepted work.

Existing resources viz. human intellectual capital & infrastructure with physical capital, trade contacts, business processes, Intangibles as Brand and similar such, are leveraged in the process with new resources that are generated and acquired will be in terms of capabilities and skill to develop new systems as products and processes for diversifying into new markets (Wernerfelt, 1984). Knowledge-based view theory has knowledge development and deployment orientation required for sustainable competitive advantage (e.g., King and Zeithaml, 2003; Martin and

Salomon, 2003). It is an inherent nature for knowledge development and practices since innovation orientation involve deep understandings of practices and procedures about innovation with the new knowledge, which is requisite and the knowledge capital rolling out in every function of the organization, such that it has continued growing and transforming characteristics such that it evolves to the next level strengthening paced before competitors and markets. This leads to understanding that the real source of competitive advantage needed is the innovation orientation, with enablers of Innovation and knowledge development activities to keep the strategic intent derived from functional competencies such as human resources, structural setting, relational activities, marketing, and operations (Chou & Liu, 2013).

2.9 Innovation in Indian Industry

Emerging Technologies report provides an understanding of the patent landscape of Indian companies in the US. They file patents in India across domain areas, where they wish to practice the technology patented especially with a deep dive on technology patents.

Emerging Tech to Help Drive Innovation, Inclusion, And Transparency: Budget 2020. New Delhi, in01st February 2020, NASSCOM[1] has articulated for the country. The report on Report of the "Expert Committee on Innovation and Entrepreneurship August 2015, NITI Aayog, New Delhi", for recommendations to boost entrepreneurship and innovation in India, with recommendations elements of enablers of Innovation such as capabilities, skillset, etc. Also, the "Atal Innovation Mission (AIM)" is a flagship initiative set up by the "NITI Aayog" to promote innovation.

The India Innovation Index 2019 is monitoring the Innovation state within the Indian States. The Figure below shows that India spends approximately 0.7percent of its GDP on research and development. This level of expenditure is expected in developing economies. This falls short of the achievement needed if it must be on the Innovation as a strategic aim for developing its capabilities.

Need for Innovation in Indian

[1] Source: Report https://www.nasscom.in/press/emerging-tech-help-drive-innovation-inclusion-and-transparency-budget-2020).

Intellectual property figures given for the world by countries in the Introduction chapter and the comparison with India has in its performance shows that there is a very large gap in performance with successful countries. The figures from WIPO reporting the Total IP positions of the world in specific terms of patents, Marks, and Design. The share for China is substantial underworld ranking. India holds 12th Position in the world ranking and the gap is large. This is clearly stating that there is potential for India for gathering a larger number of patients.

In line with the above sightings, the study of innovation enablers and capabilities within the Indian context at the organization level is taken up. Investigation of Innovation framework elements as capabilities and enablers of Innovation, at a component level. The capabilities of Innovation are best captured from insights of employees in Indian organizations; hence the study is a perceptual one (Line of inquiry #9).

2.10 Industries and Large Firms

The Innovation study here is to see the Perception of the Elements of Innovation framework elements and Innovation performance that have on the organization. The stages of Innovation and then the deployment are the stages for Innovation to be adopted. Before Innovation enters Innovation's early adoption, the Innovation has to display Innovation success traits. This perception of an organization's performance as the Outcome of Innovation. Concerning Spending., the sectors that show some activities are seen from these we select ICT Industries, Banking, and Financial Services Industry and Pharmaceutical Industry.

Large firms have advantages as financial resources, infrastructure, R&D capabilities, for strengthening the innovation if strategized well else it may become a weakness due to procedural rigidities. With businesses, the strategies, including innovations, 'core competency' of a large firm, knowledge sets assimilated, due to its survival and set norms, can become 'core rigidities', hindering progression along paths unfamiliar to the firm (Leonard-Barton,1992).

How is the perceived effect compared for Innovation enablers and Innovation performance for sectors? (Line of inquiry #8)

3 Theoretical Model

The literature reviews the following outcomes in the enablers of Innovation and Innovation outcome. This study needs to develop a model asking the pertinent question on the components of Innovation capital and their interactions which have been details throughout the literature review. These answers we seek in the Indian context and for India as a developing country. The study is done for Indian companies for the perception of the employees, as a unit of analysis, as the respondents.

Key theories on innovation were reviewed, and variables were hypothesized enablers of Innovation activity with Human Intellectual capital, Relational, and Networking capital, Structural capital with the Innovation value chain. This is aided by Absorptive capacity for an innovation success outcome that leads to innovation success as perceived by employees as individuals. This leads to the formation of the theoretical model that forms the basis of the following selection and analysis.

3.1 The study of Innovation

Damanpour (1991, p.556) defined innovation as "the generation, development, and implementation of new ideas or behaviors" and further elaborates on the premise of the innovation. (Damanpour, 1991, Damanpour, 2014). This definition is considered as it covers the aspect needed for Innovation and enablers of Innovation studies.

Second definition: "a process of creating and managing knowledge for the development and introduction of something new and useful". The relation between the newness and its contribution to value creation is defined here. It is imperative that integrating various types of knowledge along the innovation process becomes a part of innovation. (Wallin & Krogh, 2010), this definition discusses integration which gives wider scope and understanding of the phenomenon. Further, they define the process as "Innovation is a process that involves the creation of relevant knowledge" such as customer needs, market, and technology.

Table 7: Innovation as a concept

"Review of Concepts	Major Aspects	Reference
Definition of Innovation	Review of Literature for Concept and Definition of Innovation.	Adams et al., 2006; Al-Debei & Avison, 2010; Anderson et al., 2014; Baregheh et al., 2009; Carayannis et al., 2018; Carayannis & Provance, 2008;

	Damanpour (1991) defines innovation from an organizational perspective as *"The adoption of an idea or behavior, whether a system, policy, program, device, process, product or service, that is new to the adopting organization"*	Damanpour, 1991; Fjeldstad & Snow, 2018; Gopalakrishnan & Damanpour, 1997; Goswami & Mathew, 2005; Milbergs & Vonortas, 2004; Moore & Benbasat, 1991; Pope et al., 2006; Stone et al., 2008; Wheeldon & Faubert, 2009; Yeh-Yun Lin & Yi-Ching Chen, 2007; Zhu et al., 2017
Essential characteristics of Innovation considered for this study	**Innovation is a practical construct** with a beneficial outcome & Innovation is a lower-order concept to Organizational Change (Damanpour, 2017) The innovation process is divided into two stages – '**Generation of Innovation' and 'Adoption of Innovation'** are distinct processes (Tornatzky and Fleischer, 1990, Damanpour & Gopalakrishnan, 1998). **Innovation involves research, development, and commercialization**-typically involves the following three interconnected stages (Lev, 2001). And there is **no definite knowledge of the mechanism** that the how leaders influence Innovation (Denti, 2012) The **domain of innovation orientation is a multidimensional knowledge structure** and a framework for its consequences in an organizational context. **The framework defines knowledge structure as composed of learning philosophy, strategic direction, and trans functional beliefs** within an organization. (Siguaw, 2006).	(Damanpour, 2017; Damanpour et al., 2018; Gopalakrishnan & Damanpour, 1997; (Bechky, 2008; Damanpour, 1996; Damapanpour, F; Sabat, K.A.; & Evan, 1989; Frambach & Schillewaert, 2002; Gopalakrishnan & Damanpour, 1997; Ven & Damanpour, 1991; Walker et al., 2010) Tornatzky and Fleischer (1990) (Adams et al., 2006; Åstebro & Dahlin, 2003; Lev, 2001) (Andrew et al., 2007; Chesbrough, 2010; Den Hartigh et al., 2016; Denti & Hemlin, 2012; García-Morales et al., 2008; Gottman et al., 1998; Ho, 2016; Marion & Uhl-Bien, 2001; Mejia-Trejo & Sanchez-Gutierrez, 2016; S.Jha et al., 2016; Smith, Busi, Ball, et al., 2008; Stock et al., 2014)
Innovation Framework	**Innovation framework** is an essential supporting structure of resources and processes that aid innovation and innovation activity. **Develops a comprehensive, organized framework for understanding innovation orientation and its effects.** Where innovation orientation fosters the development of organizational competencies. **An innovation framework as a substructure plan depends upon an organization's ability** to execute under enablers of Innovation as capability, assumptions, methods, and notions held within the organization. **Within the Innovation framework established procedures** for dynamic capabilities **framework of competencies as a subsystem normally evolves "**	(Horn & Brem, 2013; Jong et al., 2013; Siguaw, 2006; Zhao et al., 2013) (Mario Gomes Augustoa, 2014) (Siguaw et al., 2006) (Rajapathirana, 2018; Siguaw, 2006; Lancker et al., 2016)

Innovation is an abstract concept and there might be differences in perception within the organization as perceived by employees. (Lines of Enquiry #1)

3.2 Concept of Influence and respondents' characteristics

The concept of influence here depicts the capacity of the innovation resources within the framework to affect the character of development or behavior of the organization's performance (Greene et al., 1989; Levine & White, 1961).

The employees of the company involved in value chain activities will be predominantly needed to be aware and create an eco-system. These are also the people who are required to know innovation and efforts required to innovate as internal system. (Subdbo, 2000, Wang 2020)

3.3 Innovation Patterns in an Organisation

From the discussion by the authors where emergent patterns of innovation are discussed the most common, especially among large service firms (which excludes other than types i.e. (i) specialised R&D units and (ii) Specialised expertise in problem solving for clients, (iii) Entrepreneurial ventures (iv) Externally driven as supplier driven (v) Network Driven). In organisations, t*here is not an R&D department*. Innovations and an orientation toward innovativeness are inspired by the firm's strategy. Research is seen as a widely diffused task (many members of staff contribute toward developing innovative solutions). Development, which typically requires more explicit effort and time, is undertaken by ad hoc project teams. (Miles, 2001, Sapprasert, K., & Clausen, T. H, 2012)[2]

3.4 Perceptual Study

The concept of perception here depicts the awareness and agreement on the capacity of intangible resource treatment within an organization. The innovation resources and knowledge-based view within the enabler identified to affect innovation outcome as an organization's innovation Success (Greene et al., 1989; Levine & White, 1961). The perception is given as following as "Broadly construed, science aims to understand the nature of "the world."

[2]

1) Miles, I. (2001). Services innovation: a reconfiguration of innovation studies (pp. 01-05). PREST, University of Manchester.
2) Miles, I, 2000 (revision of 1988 paper) "Sectoral and Organisational Patterns of Use of Information Technology: UK. Data on services in the 1980s" online publication available at http://les.man.ac.uk/cric/Ian_Miles/Papers/yap.htm
3) Sapprasert, K., & Clausen, T. H. (2012). Organizational innovation and its effects. Industrial and Corporate Change, 21(5), 1283–1305.
4) Sundbo, J., & F. Gallouj, 2000, "Innovation as a Loosely Coupled System in Services", in Metcalfe S. & Miles, I. (eds.) 2000, Innovation Systems in the Service Economy Dordrecht: Kluwer.
5) Wang, F., & Chen, K. (2020). Do product imitation and innovation require different patterns of organizational innovation? Evidence from Chinese firms. Journal of Business Research, 106, 60-74.

3.4.1 Employee Perception of Innovation within the Organisation

Organisational Studies have quantified organizational-level traits by studying a set of employees who exhibit behavioral patterns. The behaviors exhibited by employees are the patterns exhibited as a phenomenon being studied within the Organization (Thayer, 2007). Here the observation is from the employees, is lower level than an organization, for the analysis of the organizational characteristics.

The behavioral aspects of the organization emerge for this organizational level study (Damanpour, Sanchez-Henriquez, & Chiu, 2018). Further "Management innovation is primarily an organizational-level phenomenon and was developed after Schumpeter's early definition of innovation and its types." (Damanpour 2014).

3.4.2 Innovation Patterns

Innovation in services will be on technology as well as organisations, with understandable transformations the development propensity and technique for different classes of service firm and sector (Lancker, 2012).

Large- scale service firms have important roles in arranging innovation (mainly through their supply chains), and Knowledge-Intensive Business Services (KIBS) play important roles in facilitating innovation across the economy. And the service economy has a major stake in innovation processes (Subdbo, 2000)

The focus on sharp demarcation between services and manufacturing innovation is necessary as the study of services innovation throws light on innovation processes across the whole economy. (Miles, 2001, Wyatt, 2000)

Innovation is an abstract concept and there usually are differences in perception of Innovation framework and enablers by employees as individuals within an Organisation (Thayer, 2007, Maresch et al., 2016; Szabo et al., 2013). (RESEARCH GAP #1)

Hence the need to study employees' perception of the enablers of Innovation, innovation enablers, and Innovation performance.

3.5 Measurement Methods

The methods discussed for the Perception-study are best suited is based on Innovation activity, Innovation value chain, Capacity, and Innovation performance. This is a perceptive study of enablers of Innovation, Showing the interaction of the dynamic processes within the organization. These can show internal interaction and Perceptions for Innovation outcomes. (Luthy,1998, Williams, 2000)

- "Market Capitalization Methods" (MCM): Difference between a company's market capitalization and stockholders' equity its intellectual capital
- "Direct Intellectual Capital methods "(DIC) by Estimate the monetary value -the value of intangible assets
- "Return on Assets methods" (ROA): Earnings of a company for some times are divided by the average tangible assets
- "Innovation Indexes" for Inputs and Outputs of innovation
- "Component level studies" –For Innovation enablers. (Adopted for this study) (Luthy, 1998, Williams, 2000).

Direct Intellectual Capital methods (DIC)

This is estimated by considering the Intangible assets and then considering the monetary value of these components. The identification, valuation, and separation of these components is the major task. Once done they act like components and much easier to treat and so they can be directly evaluated, either individually or as an aggregated coefficient.

Market Capitalization Methods (MCM)

This is by the way of Calculation of the difference between a company's market capitalization value and its stockholders' equity value, and as the value of its intellectual capital or intangible assets, which is not accounted in the books of accounts by the company.

Return on Assets methods (ROA)

"The average pre-tax earnings of a company for a period are divided by the average tangible assets of the company. The result is a company ROA that is then compared with its industry average. The difference is multiplied by the company's average tangible assets to calculate average annual earnings from the Intangibles. Dividing the above-average earnings by the

company's average cost of capital or an interest rate, one can derive an estimate of the value of its intangible assets or intellectual capital".

Component level or Scorecard Methods (SC)

"The various components of intangible assets or intellectual capital are identified, and indicators and indices are generated and reported in scorecards or as graphs. SC methods are like DIS methods, except that no estimate is made of the monetary value -the value of the Intangible assets. A composite index may or may not be produced."

Perception-based Study (Value Added Intellectual Coefficient (VAIC))

"The study based on Perception-based was first developed in 1997 as Value Added Intellectual Coefficient (VAIC™) by Pulic 1997, it was the measure of intangibles and so it was not directly a ROA study. This was a measure of efficient Intellectual Capital employed to create Value. It primarily considered Capital employed, the Human Intellectual capital present, and the Structural capital. And is very similar to this study where we measure the innovation activity, Innovation value chain, Absorptive Capacity, and Innovation performance."

Table 8: Methods of measurement

"Method	Process	Outcome	Discussion
Direct Intellectual Capital methods (DIC)	*Estimate the monetary value -the value of intangible assets*	Asset estimation for Potential	No explanation of the results or dynamics within Innovation as a process
Market Capitalization Methods (MCM):	*difference between a company's market capitalization and its stockholders' equity as the value of its intellectual capital*	External measure by crowdsourcing	Observes from an investor's point of view, has no evaluation of the inputs needed.
Return on Assets methods (ROA):	*earnings of a company for some times are divided by the average tangible assets*	Financial aggregates	Observes from the Financial management view, has no evaluation of the inputs needed?
Study of Various Innovation Indexes	*A survey method for Inputs and Outputs of innovation*	Single index as an outcome	These can be used for comparison only for Industries, Nations. Are static measures only
Component level	***The various components of intangible assets or intellectual capital are identified and indicators***	**Processes observed**	**Static markers given to assets identified. The need for propensity missing**
Perception-study at based on Innovation activity, Innovation value chain, Capacity, and Innovation performance	***A perceptive study of Organizational Drivers***	**Shows the interaction of the dynamic processes within the organization**	**These can show internal interaction and Perceptions for Innovation outcomes".**
Source: Luthy (1998) and Williams (2000).			

Perception-based study for the Innovation framework is a component level(Luthy, 1998).

This is study shows the Innovation activity by the Innovation Capital assets exhibiting the enablers of Innovation for Innovation performance. The Innovation capital as the Human Intellectual Capital, Structural Capital, Relational capital, and Innovation value chain are discussed. This study is developed by the perception of individuals involved in these activities as a direct measure to understand the influence of the Innovation framework, which is a set of Innovation capital assets in action. Thus, the indicators show the internal interaction and Perceptions for Innovation outcomes.

Table 9: Component Level Innovation Studies

"Author	Brief Summary	Central Idea
(Bass, 1969)	defining the S curve - which depicts the volume of adoption to the time and the rate of adoption is outlined for the adoption of innovation.	Diffusion of Innovation
(Damanpour, 1996).	This study has used a meta-analytic procedure for multivariate analysis, the study has generated models of structural complexity innovation and organizational size-innovation that are more encompassing and significant.	Structural complexity and Size
(Frambach & Schillewaert, 2002)	Organizational innovation adoption draws insight into adoption processes, their inhibitors, and stimulators for the organizational level and the individual adopter within an organization.	Adoption Process and drivers
(Subramaniam, 2005)	This study of intellectual capital's (IC) influence on various innovative capabilities (a) Organizational capital (b) human capital (c) human capital by itself was negatively associated with the radical innovative capability, and (d) social capital is a significant role. For incremental and radical innovative capabilities.	Intellectual Capital and Capability
(Hekkert, 2007)	A method for systematically mapping those processes taking place in innovation systems and resulting in technological change.	Dynamics of Innovation Systems.
(Stone, 2008)	The study focuses on three methods of measurement of innovation; (i) The aggregate indices approach; (ii) Monetizing Innovation monetary value of innovative activities; (iii) Measuring intangibles using proxies and techniques (iv) Measuring the Investment in Intangibles.	Measuring Innovation
(Sánchez, 2009)	This study is for the measurement of Innovation and development of the theory and practice of an Intellectual Capital (IC) for universities.	Intellectual Capital management for universities
(Stilgoe, 2013)	Explore four integrated dimensions of responsible innovation: anticipation, reflexivity, inclusion, and responsiveness.	Responsible Innovation framework with Anticipation, Reflexivity, Inclusion, and Responsiveness
(Anderson, 2014)	Guiding Framework on Creativity and innovation	Creativity and Innovation from Individual to Organisational level
(Kim, 2015)	The components of service innovation depend on the dynamic capability of the firm- the theoretical foundation for the dynamic service capabilities framework.	Research Framework for resources and capability based on RBV
(Hartono, 2015)	Integration of new ideas and relevant a firm's capability, a wider range of internal and external new ideas sources and types of innovation as the output of innovation activities.	Innovation Process from idea generation, Conversion, and exploitation.
(Lendel et al., 2015)	The study describes Management of innovation processes-, content analysis - the study of documents, synthesis, comparative analysis, process analysis, statistical analysis, modeling, programming, empirical research methods, and others.	Model of innovation processes management in the company

(Cassol et al., 2016)	This study analyses the relationship between absorptive capacity, intellectual capital, and innovation.	Intellectual Capital and Innovation Outcome with Absorptive capacity relationship study
(Damanpour, 2017)	In this study, Damanpour has discussed Organization Theory, Organizational Behaviour, Technology, and Innovation Management. decipher key typologies, primary sets of antecedents, and performance consequences of generating and adopting innovations. New studies to advance the state of knowledge on organizational innovation, thus bringing the definitions to unified understanding.	Discussion on Organisational Theory and Innovation"

Here we find that the measurement of Innovation in several studies and as methods for measuring innovation differ. This also includes the study by Damanpour, adopted for definition of Innovation, there is a contextual and methodological difference to the proposed measurement as in this study. (Kim, 2015, Damanpour, 2018) (RESEARCH GAP#2)

Scope for developing a measurement instrument for Innovation, Innovation enablers, Innovation framework for Innovation Activity for Innovation performance.

3.6 Resource- and Knowledge-Based View (RBV & KBV).

"Resource-Based View (RBV) of innovation advocates building internal resources. Resources, by themselves, are raw materials. Resources, when combined in unique ways, create 'capabilities' (Barney, 1986; Amit &J.H. Schoemaker, 1993). Resources and capabilities together provide the engine of growth."

The capability for resources derives its orientation from Knowledge-Based View (KBV) which is vital and is closely linked to resources-based management (RBV) (Chou & Liu, 2013). The distinction in the application of KBV is that though Knowledge is also a resource, its treatment is different due to its dynamic nature. Knowledge-based resources are essential for capability deployment. KBV is also considered as part of enablers of innovation within the capability as it aids in the development of capacity building in terms of skill, knowledge dissemination, and competencies for creating value (Wernerfelt, 1984; Zhao, 2013)[3] and as a supporting theory for Capability formation in this study.

"An innovation enabler for an infrastructure plan depends upon an organization's ability to execute within, assumptions, methods, and notions held within the organization. The best-practice innovation framework is good for all types of organizations. From a broad range perspective to in-depth requirements of Innovation. Innovation practice needs to be disciplined

[3] Wernerfelt, B. (1984). A resource-based view of the firm. Strategic management journal, 5(2), 171-180.
Zhao, Y. L., Song, M., & Storm, G. L. (2013). Founding team capabilities and new venture performance: The mediating role of strategic positional advantages. Entrepreneurship Theory and Practice, 37(4), 789-814.

exercise. Organizations relying on one-off chances, serendipitous acts of creativity, taking an unstructured approach, or with poor implementation may only see incremental improvements at best. Strategic approach planning integrates value delivery as part of innovation practice. A strategic innovation capability is responsible for a portfolio of advanced business growth opportunities" (Vohel, 2018)[4] It is important to maintain a competitive advantage. managing international activities like a portfolio will undermine the possibility of achieving competitive advantage (Porter, 1986)

Knowledge-based resources are essential for capability deployment. KBV is also considered as part of enablers of innovation within the capability as an enabler, aids in the development of capacity building in terms of skill, knowledge dissemination, and capabilities for creating value (Wernerfelt, 1984; Zhao, 2013), and as a supporting theory for Capability formation in this study.

3.7 Innovation Framework

Innovation activities are intended activities that culminate into Innovation. These are over several domains as in the area of all scientific, technological, organizational, financial, and commercial steps. Some innovation activities are developed to manage the new process itself are new. Others may not be new but mature which are necessary for the execution of innovations. Innovation activities also include R&D that is not directly related to the development of specific innovation. As for intellectual assets (Andrikopoulos, 2010) assimilation, there are four assets identified as critical to the innovation activity (Carmeli, 2004); these are the components of the enablers as innovation capability (Crossan, 2010; Vohel, 2018).

From the dynamic capabilities, there are certain activity resources as the Human Intellectual capital, the Administrative and structural setup, and the networking and relational setup within an organization. To perform these activities using the resources, the first asset is Human Intellectual Capital (Wright, 2001, Gebauer, 2012, Eisenhardt, 2000, Nahapiet, 1998, Amabile, 1993). Wright (2001) discusses the resource-based view and the capability of Human intellectual capital in the generation of innovation. From an organizational point of view, the dynamic capability of handling and delivering knowledge-based resources as a dynamic

[4] Frank Voehl, H. James Harrington, Rick Fernandez, and Brett Trusko 2019, "The Framework for Innovation an Entrepreneur's Guide to the Body of Innovation Knowledge", The Management Handbooks for Results Series, by Taylor & Francis Group-

paradigm has been substantiated (Eisenhardt, 2000). The complexity in the process of innovation is discussed as determinants of strategic innovation (Gebauer, 2012) and dynamic capability requirements for success and survival with open innovation systems, and the patterns that establish perspectives and emerging themes (Bogers, 2017). The second asset is the Relational & Networking Capital which represents the networking capabilities in organizations where the exchange of knowledge, management of knowledge platforms, sharing of knowledge, and generation of knowledge are in constant movement. Knowledge transfer in intra-organizational networks has a major impact on learning and capability building with network position and absorptive capacity on innovation and performance (Tsai, W., 2001, Bogers et all, 2017, Elia G, et al, 2017). The third asset is Organisational Structural Capital which encompasses the administrative setup, the infrastructure, the platforms within an organization (Gracioli,2012, Crowl, A, 2015). And the fourth asset is the dynamic, Innovation value chain, which is the actual journey of innovation as a process. This asset encompasses the dynamic nature propensity of the activity capture, unlike the other three assets. The aspects for an organization with the posture that it holds and the propensity i.e., the thrust and direction that it takes are equally important (Carayannis, E. G., Goletsis, Y., & Grigoroudis, E., 2018).

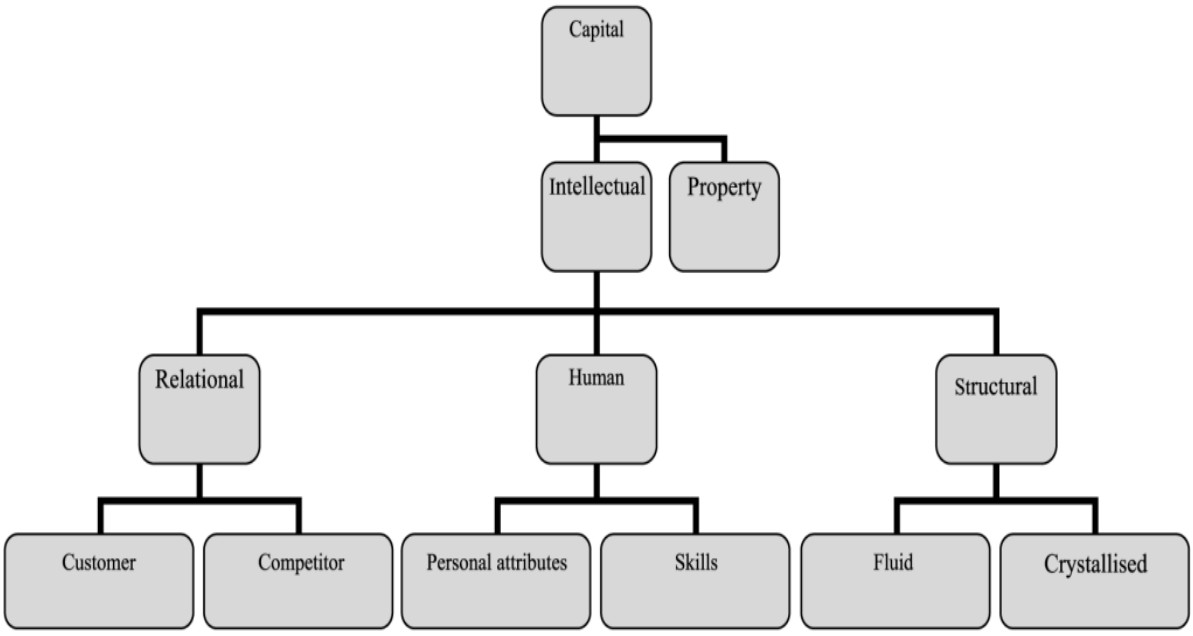


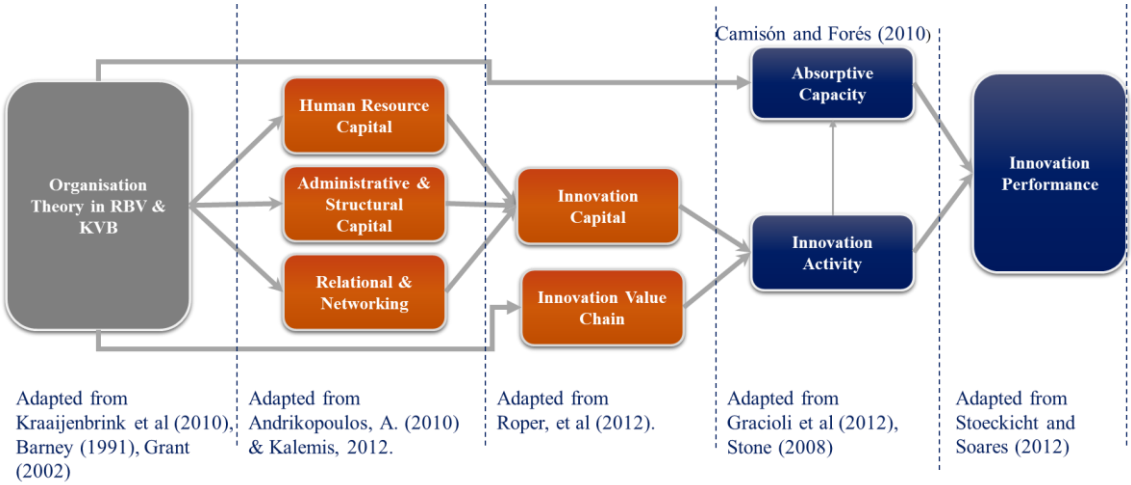
Figure 1: Common representation of the Framework of Intellectual Capital (IC)

Adapted from Andrikopoulos, A. (2010) & Kalemis, 2012.
(IC categorization. (Sources: Brooking, 1996; Roos and Roos, 1997; Bontis, 1999; Edvinsson, 1997; Stewar, 1999; Grasenick and Low, 2004)

3.8 Enablers of Innovation and Innovation Framework

Enablers of Innovation, capabilities are the assets within the organization. These may be tangible or intangible assets. Within an organization, capabilities are a set of portfolios that makes the organization capable as competent to handle various tasks for strategic outcomes. The factors that contribute to capabilities are processes, tools and systems, knowledge, skill, behaviors, and combinations thereof, and many other factors (Salerno et al., 2015).

Figure 2: Developed Innovation Frameworks for Measuring Innovation Performance


Organisation Theory in RBV & KVB
Human Resource Capital
Administrative & Structural Capital
Relational & Networking
Innovation Capital
Innovation Value Chain
Camisón and Forés (2010)
Absorptive Capacity
Innovation Activity
Innovation Performance
Adapted from Kraaijenbrink et al (2010), Barney (1991), Grant (2002)
Adapted from Andrikopoulos, A. (2010) & Kalemis, 2012.
Adapted from Roper, et al (2012).
Adapted from Gracioli et al (2012), Stone (2008)
Adapted from Stoeckicht and Soares (2012)

These are a battery of capabilities within the firm that is responsible for maintaining its place in the industry for primarily profitability and survival with having control of resources strategically as Resource-based View of the Firm (Penrose, 1959) This tacit knowledge as the "Know-How" is rooted in the capabilities of the firm, which brings in the firms' abilities to performs, that are considered valuable.

According to early works by Leonard, the capability of any business can be defined primarily into three categories as Core Capabilities, Enabling Capabilities, and Supplemental Capabilities (Leonard,1995). From all the given capabilities, few capabilities are responsible as an enabler of success. The set of capabilities that are special to an organization, are distinct and cannot be imitated easily, are enablers of success are differentiating capabilities as a strategic outcome, deliver value to a customer, and such specific aspects to create a capability portfolio which directly deals with an outcome or a strategic intent it is essential to understand the pre-requisite, the process and outcome of a capability.

Table 10: Studies on Concept of Innovation Capabilities

REVIEW CONCEPT – INNOVATION CAPABILITIES	
MAJOR ASPECTS	REFERENCES
1. Four dimensions of a core capability – physical systems, skills, managerial systems, and values.	(**Anderson et al**., 2014; Battisti & Stoneman, 2010; **Berghman** et al., 2013; **Bosworth et al., 2007;** Breuer & Lüdeke-Freund, 2017**; Camisón-Zornoza et al.,** 2004; Carmona-Lavado et al., 2010; **Cassol et al., 2016;** Cosh et al., 2012; Dakhli & De Clercq, 2004; **Damanpour et al., 2018; Denti & Hemlin, 2012; Dubey et al., 2018**; **Evanschitzky et al., 2012;** Featherston et al., 2016; **Hou, 2008;** Jakšić et al., 2018; Jensen & Meckling, 1976; Kraśnicka et al., 2016; **Dorothy Leonard-Barton, 1992; Levinthal, 1989;** Magadley & Birdi, 2009; **Mamasioulas et al., 2020; Marais, 2012;** Moon et al., 2017; Mosconi & Roy, 2013; **Nahapiet & Ghoshal, 1998; Nielsen, 2012; Nonaka et al., 1994;** Nylén & Holmström, 2015; Padilha & Gomes, 2016; **Siguaw, 2006; Stilgoe et al., 2013; Teece et al., 1994;** Telbani, 2013; **Vaz et al., 2015;** Wang & Chen, 2020; Whiteman & Cooper, 2011; Zgrzywa-Ziemak, 2015)
2. Three categories a) Core b) Enabling & c) Supplemental	(Akman & Yilmaz, 2008; Al-Debei & Avison, 2010; J. Barney et al., 2001; J. B. Barney, 2001; Camisón-Haba et al., 2019; Carmeli & Tishler, 2004; Chaminade & De Fuentes, 2012; Chuang & Lin, 2017; Damanpour, 2014; Elia et al., 2017; Hou, 2008; Hullova et al., 2019; Jensen & Meckling, 1976; Jiménez-Jiménez & Sanz-Valle, 2011; Jong et al., 2013; Kim, 2015; Lane et al., 2006; Dorothy Leonard-Barton, 1992; Dorothy Leonard-Barton, 1998; Nickerson, 2004; Raffaelli et al., 2017; S.Jha et al., 2016; Siguaw, 2006; Siguaw et al., 2006; Singh et al., 2019; Smith et al., 2008; Srimannarayana, 2018; David J. Teece, 2007; David J. Teece et al., 1994; Telbani, 2013; Wirtz & Daiser, 2017; Wong & Chin, 2007; Zgrzywa-Ziemak, 2015; Zhao, 2013; Zhu et al., 2006)
3. Differentiating Capability: are special distinct & cannot be imitated easily.	Capaldo, 2015; **C. Chen, 2012**; Chuang & Lin, 2017; **Damanpour et al., 2009**; Kickul, 2009; Nickerson, 2004; **Porter, 1998,** 1991; Salim & Sulaiman, 2011; **David J. Teece, 2010; David J. Teece et al., 1994**)
4. Dynamic Capabilities - Sensing, Mobilising resources & transforming to align	(**Anderson et al., 2014**; Aragón-Correa et al., 2007**; J. Barney et al., 2001; J. B. Barney, 2001**; **Camisón-Haba et al., 2019; Camisón & López, 2010**; Cantarello et al., 2012; Chang, 2015; Chen, 2012; Chong et al., 2010; Chuang & Lin, 2017; **Damanpour, 2014; Damanpour et al., 2018; Dubey et al., 2018; Eisenhardt & Martin, 2000**; García-Morales et al., 2011; **Hobday, 2005;** Horn & Brem, 2013; Hossain, 2015; Hou, 2008; Hullova et al., 2019; Intan-Soraya & Chew, 2010; Kickul, 2009; Kim, 2015; Krishnamoorthy & Damle, 2017; Lane, Koka, Pathak, et al., 2006; Lin et al., 2016; Lopez-Cabrales et al., 2017; Madanmohan et al., 2004; **Martin & Eisenhardt, 2010; Mckelvey, 2001;** Moon et al., 2017; Mosconi & Roy, 2013; Noblet et al., 2011; Nylén & Holmström, 2015; **Priem & Butler, 2001**; Raffaelli et al., 2017; Rubalcaba, 2015; Sheng & Chien, 2016; **Siguaw, 2006; Siguaw et al., 2006; Singh et al., 2019;** Smith, Busi, Ball, et al., 2008; Street et al., 2018; **Teece, David J., Pisano, Gary, Shuen, 1997; David J. Teece, 2007, 2010; David J. Teece et al., 1994; David J. Teece et al., 1997; David J. Teece & Shuen, 1997; David J Teece et al., 1997;** Theriou et al., 2017; ul Hassan et al., 2013; Vaccaro et al., 2012; Vaz et al., 2015; **C. L. Wang & Ahmed, 2007; Wirtz et al., 2016; Wu et al., 2007**; Zhou, 2017)

A seminal study by Teece on dynamic capabilities has three aspects to Dynamic capabilities. These are First as Sensing capability, which identifies the area of research and creates opportunities. The second is seizing, which is mobilizing internal resources and ensure that the utilizing is aligned to the strategic intent. The third and the last aspect is that it is transforming in nature such that the task is completely aligned to address the opportunity and capture it completely (Teece, David J., Pisano, Gary, Shuen, 1997). Innovative capability is defined as a firm's ability to create ideas and translate them into actionable form as new/improved products, services, or processes (Wang & Ahmed, 2007) that benefit the firm refers to a firm's ability to align with other entities and aligning strategically to orient such that they leverage the outcome of innovation within an eco-system, shows innovative behaviors (Wang & Amhed, 2004, Gunday et al., 2007; Maresch et al., 2016; Szabo et al., 2013).

Several other studies that have attention towards firm's innovative capability, shoes that it is a critical asset and firms' evolution, survival are managed, in light of external competition and change (Adner, 2016; Santos, J., Zawislak, P., Franzoni, G., & Vieira, 2015; Tkachenko et al.,

2015). Innovation framework and Capabilities Portfolio have major enablers covers within. Does a portfolio have a set of capabilities in an organization that consists of combinations of task threads that might entail processes, activities, and services to obtain a result? Within that portfolio, a capability requires to be well defined and optimized to become a sustained process and well managed to evolve.

Perceived capabilities studies for Innovation may give a way to understand the key enablers of innovation. Also, our measurement studies will further infer their interaction between capability assets and the resources with pre-requisites. Capability management is a part of the value chain, assessed under value chain analysis (Porter, 1986) for the Core competencies part of core capabilities which are matured to manage the competitive advantages and in creating and delivering value to enterprises.

Innovation is an abstract concept and there usually are differences in perception of Innovation capabilities by individuals involved in innovation activities as a part of the Innovation framework (Thayer, 2007, Maresch et al., 2016; Szabo et al., 2013). (RESEARCH GAP).

Hence the need to study employees' perception of the enablers of Innovation & innovation capability

3.9 Innovation Activity

The concentration-innovation linkage is an important aspect for the influence of product or services that is given to the customer across industries and this is also responsible for different levels of innovation activity (Herrmann, 1997). Dynamic capability theory reasons that organizations' internal capabilities are responsible for sustained competitive advantage where, nature of management activity and social embeddedness is responsible for Innovation activities within an organization (Thompson, 2007). There is intellectual Capital that exhibits the capabilities required for Innovation.

- Human Intellectual Capital (HC): Organizations began to perceive the existence of a new factor of production to be managed, intellectual capital. Thus, the present study investigates the importance of intellectual capital, in Organizational Innovation Success (Gracioli et al. 2012).

How does Human Intellectual Capital affect innovation activity and Innovation? (Line of inquiry #1)

- Organizational Structural Capital (STR): AS for the human Intellectual capital and the concept of the "knowledge economy" has always gone hand-in-hand with growth in the percentage of the economy represented by services. Service industries do, indeed, reflect higher levels of intellectual capital in recent years, but did not do so a decade ago. Further, there is considerable evidence of changes in specific service and non-service industries over the period, adding details to the finding that knowledge development is not static but does vary over time and circumstance (Erickson & Rothberg, 2015).

How does Structural Capital affect Innovation Activity and Innovation? (Line of inquiry #2)

- Customer Relational & Networking Capital (REL): Knowledge Management and Innovation Capital literature, showing that the processes of creating, acquiring, maintaining, systematizing, and sharing information and knowledge and IC generation in Companies networks can be Perceptions by the network formation process, by the organizational context, as well as by the strategy, organizational culture, and stimuli to sharing knowledge (Jordão & Novas, 2017)

How does having Relational Capital affect Innovation activity and Innovation? (Line of inquiry #3)

- Innovation Value Chain (IVC): Innovation is a complex phenomenon and it is dynamic in nature within the socio-technical, socio-economic and socio-political context. It requires practice-wise provides a perspective on relative efficacies and potential ways and means to calculate differential efficacies for alternative configurations of resource allocations (E. Carayannis, n.d.; E. G. Carayannis et al., 2018). Innovation, seen as the implementation of creative ideas, has drawbacks with the leaders, who do not always encourage employee behaviors that are critical for innovation. There are a few critical factors that serve as antecedents of innovation, including employee voice and knowledge sharing, which in turn lead to creativity and innovation. In essence, the six factors play an important role and these are developing the right group norms, designing teams strategically, managing interactions with those outside the team, showing support as a leader, displaying organizational support, and using performance management effectively (Kremer et al., 2019).

How does the Innovation value chain is perceived for Innovation activity and Innovation? (Line of inquiry #4)

"Innovation has the duality of Innovation as a process and as an outcome by providing separate definitions for both concepts, as (i) Innovation activities include all developmental, financial, and commercial activities undertaken by a firm that is intended to result in innovation for the firm. (ii) Business innovation is a new or improved product or business process (or a combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm".

How is the perceived effect of Innovation Activity on Innovation? (Line of Inquiry #5)

3.10 Absorptive Capacity.

The special focus of the impact of absorptive capacity on innovation and research & development is a critical one and the theoretical foundation of the concept of absorptive capacity (Noblet and Somon, 2010).

The concept of absorptive capacities has been defined as (Cohen et Levinthal, 1989, 1990) the "ability to recognize the value of new information, assimilate it, and apply it to a commercial for adoption in the industry". While extending it to compliment this definition with "a broad set of skills needed to deal with the tacit component of transferred.

Absorptive capacity is "a firm's ability to identify, assimilate, transform, and apply valuable external knowledge. Put another way, absorptive capacity is a limit to the rate or quantity of scientific or technological information that a firm can absorb". The concept of absorptive capacity was first defined as a firm's "ability to recognize the value of new information, assimilate it, and apply it to commercial ends" by Cohen and Levinthal.

And the ability to evaluate and utilize outside knowledge is largely a function of the level of prior knowledge". Assimilated Knowledge for dissemination needs to modify this imported knowledge" (Mowery and Oxley,1995). Another perspective is "the capacity to learn and solve problems" (Kim (1997, 1998). And All-inclusive perspective offers a better-suited definition as absorptive capacities are "a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability" (Zahra and Georges (2002).

Firms with higher absorptive capacity demonstrate a greater ability to learn from partners, integrate external information, and transform it into firm-embedded knowledge (George, 2005; Salvatos, 2003; Verona & Ravasi, 2003; Woiceshyn & Daellenbach, 2005).

How is the perceived effect of Absorptive Capacity on Innovation? And does it aid Innovation activity? (Line of Inquiry #6).

How is the perceived effect of Human Intellectual capital, Customer Relational Capital, Structural Capital, and Innovation Value chain on Absorptive Capacity (Line of Inquiry #7)?

3.11 Innovation Outcome

The study is about the innovation capability and its action (Carmeli and Tishler 2004; Chuang and Lin 2017; Haynes, Thompson, and Wright 2002; Mario Gomes Augustoa and ASchool 2014; Martins and Lopes 2015; Santos, Basso, and Kimura 2018) resulting in innovation performance happen.

The relationship ship between Innovation performance for Innovation success and Organisation performance is linked. Organisational performance encompasses many factors, hence measure overall performance measure; its measure does not give a clear aspect of Innovation performance.

In the analyzed studies, innovation initiatives converge in total company performance. **(Bach, 2019)**

This research requires to study the "influence" of Innovation framework on Innovation performance (as a subordinated concept to Organisational performance) for the focus and accuracy of results**. *Evanschitzky (2012), Watts (1998), King (2006), Watts (1997), Ng (2011), Srivastava (2014), Duwe (2019)***

The need for the study perception is to have a measurable direct outcome in terms of innovation. Innovation to be accepted in the open needs to diffuse. The process of diffusion may be much later to its creation& Success. And the time lag in its creation to diffusion/acceptance does not give a direct impact, due to lagging indicators. This shows that innovation success to the diffusion of innovation or acceptance of innovation has a series of stages (Santos, Basso, and Kimura 2018). The classic study by Bass and Rogers. The drivers in the case of Rogers (Rogers M. 1998), are in five major areas as the perceived attributes (by

the customer), Decision type (customer), Communication channels (outside the organization), Social system (managerial decisions and leadership), Promotion effect(marketing). This will be far drawn to study the direct effect of the elements of the Innovation framework on innovation performance. It is after the acceptance of the innovation on the "S" curve that the product will rise in popularity and be diffused.

The Innovation Outcome can later be translated from innovation success to performance success in terms of revenue which also has a time lag. Even if considered being much later in the chain of events, it will dilute the concept for the study of the Influencing capability for innovation success and poorer results. There are studies on contingency theory to inspect the relationship between strategy, performance, and competitive environment (Ho, 2015). And so, it is an intermediate stage of study so attempted as perception-based study

Time dimension for catching up from creation to the cyclic phases of the innovation will aid in tracking innovation life performance (Den Hartigh et al. 2016; Kraśnicka, Głód, and Wronka-Pośpiech 2017). In light of this aspect, the financial indicators of a period cannot be used to justify innovation. And to add to that the financial indicators are made up of many other aspects as the Cost aspect, strategic intent, the competition – forces in the market, the markets, the economy.

Table 11: Studies on Innovation Performance Outcomes

Studies on Innovation Performance Outcomes	
Evanschitzky, H., Eisend, M., Calantone, R. J., & Jiang, Y. (2012).	Success factors of product innovation
Watts, R. J., Porter, A. L., & Newman, N. C. (1998)	Innovation forecasting using bibliometrics
Coates, V., Farooque, M., Klavans, R., Lapid, K., Linstone, H. A., Pistorius, C., & Porter, A. L. (2001)	The future of technological forecasting
King, S. F., & Burgess, T. F. (2006)	A dynamic model of enterprise system innovation, after critical success factors.
De Sousa Jabbour, A. B. L., Jabbour, C. J. C., Foropon, C., & Godinho Filho, M. (2018	The role of critical success factors in Technological Forecasting and Social Change.
Watts, R. J., & Porter, A. L. (1997)	Early Technological forecasting and social change studies
Srivastava, S., & Misra, M. (2014)	valuation matrix for critical success factors
Duwe, D., & Spath, D. (2019)	Early Innovation Success Estimation through New Technological Indicators

For performance has been considered as Innovation performance.

1. The study is about the innovation framework and its influence(Carmeli & Tishler, 2004; Chuang & Lin, 2017; Haynes et al., 2002; Mario Gomes Augustoa, 2014; Martins & Lopes, 2015; Santos et al., 2018) to make innovation performance happen. The need of the study is to have a measurable direct outcome in terms of innovation. From OEDC (2005) the definition of innovation outcomes Innovation of Product, Business process innovation is considered.
2. Innovation to be accepted in the open needs to diffuse. The process of diffusion may be much later to its creation& Success. And the time lag in its creation to diffusion/acceptance does not give a direct impact, due to lagging indicators. This shows that the innovation success to the diffusion of innovation or acceptance of innovation has series of stages(Santos et al., 2018). The classic study by Bass and Rogers. The drivers in the case of Rogers (Rogers M., 1998), are in five major areas as the perceived attributes (by customer), Decision type (customer), Communication channels (outside the organization), Social system (managerial decisions and leadership), Promotion effect(marketing). This will be far drawn to study the direct effect of the framework parameters on innovation. It is after the acceptance of the innovation on the "S" curve that the product will raise in popularity and be diffused.
3. The Innovation performance as Success indicators can later be translated from innovation success to performance success in terms of revenue which also has a time lag. Even if considered being much later in the chain of events, will dilute the concept for the study of the Influencing framework for innovation success and poorer results. There are studies on contingency theory to inspect the relationship between strategy, performance, and competitive environment (Ho, 2015). And so, it is an intermediate stage of study so attempted as perception-based study
4. The evolution of the idea and its realization as Innovation needs to be managed for an Innovation success as an outcome. It is a very critical time for the top management to take the right strategy for its deployment as depending on the business positioning it may or may not be a great commercial success. (Walker et al., 2010). The next stage is commercialization. During this phase, the innovation has already been proven to have potential. Our study is for the innovation success that was supported by organisational drivers.
5. There is one study that speaks about the time dimension for catching up from creation to the cyclic phases of the innovation. These will need tracking innovation(Den Hartigh et al., 2016; Kraśnicka et al., 2016). In light of this aspect, the financial indicators of a

period cannot be used to justify the innovation. And to add to that the financial indicators are made up of many other aspects as the Cost aspect, strategic intent, the competition – forces in the market, the markets, the economy.

6. The literature review the proxy variables to study Performance measures are akin to Sales Growth, Market Share, and Profitability as percentages(Akca & Ozer, 2014; Prajogo, 2006; Van Lancker, Mondelaers, Wauters, & Van Huylenbroeck, 2016). The risk lies also in the fact that Innovation as a newcomer for large-scale companies may not be a significant contributor in the early stage.
7. There are a few significant studies and the methodology used for the study of performance measures in the following points.
    - The study on "Intellectual Capital and Profitability" ((Martins & Lopes, 2015)discusses the intangibles of a company to be responsible for efficient as well as unexpected returns where they have investigated the value of the firm, profitability, and degree of intangibility. The method used is by association using the ratio parameters ROA, ROCE, ROS, and Tobin's Q. This gives an associative relationship with proxy variables. They have concluded that there is no apparent difference between the value and profitability indicators and the applicability of intangibles. "We conclude that there is no difference between this indicator distribution and the degree of intangibility across the groups under analysis. This evidence can be supported by the indicator nature, strongly focused on operational and internal efficiency. Across the sectors under analysis, we also found some important differences."
    - The study on "Organizational innovation management" (Wong & Chin, 2007) has developed organization-wide "organizational innovation management" hierarchical framework as a foundation for a comprehensive study. This study is undertaken to understand critical success factors of organizational innovation management for benefit of managers as an applied framework for decision taking. The method used for this study is taking critical factors of culture, leadership, employee capability, Knowledge leveraging internally and externally, learning. And they have carried out a perception study for exploratory factor analysis of the critical factors.

Several studies exist on Innovation enablers and capabilities as innovation framework, but these have contextual and methodological differences, very few have Innovation activity as part of capabilities. The components are IA, AC, Innovation as perceived. (RESEARCH

GAP#3). **Scope for developing the component level measurement of Innovation capabilities, with their Activities, Absorptive Capacity (with Realized capacities, Potential capacities of Organisational knowledge) for Innovation.**

The Concept Mapping for integrative Literature review

Table 12: The Concept Matrix

"CONCEPT MATRIX	Year	*Innovation Activity (IA)*	*Human Intellectual Capital (HR)*	*Relational Capital (REL)*	*Structure Capital (STR)*	*Innovation value Chain (VAL)*	*Absorptive Capacity (AC)*	*Innovation Outcome (INNO)*
Authors	Year	IA	HR	REL	STR	VAL	AC	INNO
Salazar-Elena, J.C., Cancino, C.A., López Cancion, A., Guimón de Ros, J.	2020		X		X			
Susanty, A.I., Yuningsih, Y., Anggadwita, G.	2019		X	X	X		X	X
Tonial, G., Cassol, A., Selig, P. M., & Giugliani, E.	2019	X	X					X
Jokubauskienė, R., Vaitkienė, R.	2019		X	X	X		X	
Ganguly, A., Talukdar, A., Chatterjee, D.	2019	X	X				X	
Takeda, Y.	2019				X		X	
Bogers, M., Zobel, A.-K., Afuah, A., (...), Sims, J., Ter Wal, A.L.J.	2017		X			X	X	
Evans, S., Vladimirova, D., Holgado, M., (...), Silva, E.A., Barlow, C.Y.	2017		X	X	X			X
Matoskova, J	2017			X	X		X	
Elia, G., Lerro, A., Passiante, G., Schiuma, G.	2017		X			X	X	X
Abuzyarova, M.I.	2017		X			X		X
Cassol, A., Goncalo, C. R., & Ruas, R. L.	2016		X			X	X	
Crowl, A., Sharma, A., Sorge, L., Sorensen, T.	2015							
G. Scott Ericksona,⁎, Helen N. Rothbergb a	2015		X	X			X	X
De Marchi, V., Maria, E.D., Ponte, S.	2014					X		X
Gebauer, H., Worch, H., & Truffer, B.	2012							
Gannon, J. M., Doherty, L., & Roper, A.	2012		X					X
Gracioli, C., Godoy, L. P., Lorenzett, D. B., & Godoy, T. P.	2012	X	X			X	X	X
Dahlander, L., & Gann, D. M.	2010		X	X			X	
Spithoven, A., Clarysse, B., & Knockaert, M. (2010).	2010	X	X				X	X
Yam, R.C.M., Lo, W., Tang, E.P.Y., Law, A.K.W.	2010		X				X	X
Hansen, M.T., Birkinshaw, J.	2007		X	X	X	X		
Teece, D.J.	2007	X					X	X
Wu, S. H., Lin, L. Y., & Hsu, M. Y. (2007).	2007	X	X				X	X
Laursen, K., Salter, A.	2006	X	X	X		X		X
Jansen, J.J.P., Van Den Bosch, F.A.J., Volberda, H.W.	2006	X				X	X	X
Peter J. Lane, Balaji R. Koka and Seemantini Pathak	2006			X		X	X	X
Bock, G.-W., Zmud, R.W., Kim, Y.-G., Lee, J.-N.	2005		X	X	X		X	
Inkpen, A.C., Tsang, E.W.K.	2005			X			X	
Caloghirou, Y., Kastelli, I., & Tsakanikas, A.	2004		X	X	X		X	X
Carmeli, A., & Tishler, A.	2004		X	X			X	X
Carmeli, A., Tishler, A.	2004	X		X	X			X
Carmeli, A.	2004	X			X			
William John Martin	2004		X			X	X	
Benner, M.J., Tushman, M.L.	2003	X			X			X
Blyler, M., & Coff, R. W.	2003			X	X		X	
Adler, P.S., Kwon, S.-W.	2002	X	X	X				

Sveiby KE	2002	X			X		X	
Aranda, D.A. and Molina-Fernandez, L.M.	2002	X	X		X		X	
Zahra, S.A., George, G.	2002		X				X	
Zahra & George	2002			X		X	X	X
Tsai, W.	2001		X	X		X	X	X
Wright, P.M., Dunford, B.B., Snell, S.A.	2001		X					X
Sveiby KE	2001	X	X	X	X	X		
Eisenhardt, K. M., & Martin, J. A.	2000		X	X	X	X		X
Bontis, N., Keow, W. C. C., & Richardson, S. (2000).	2000	X	X				X	X
Joia, L.A.	2000	X	X			X	X	
Crossan, M.M., Lane, H.W., White, R.E.	1999						X	
Nahapiet, J., Ghoshal, S.	1998	X	X	X	X			X
Bontis, N.	1998	X	X					X
Galunic, D. C., & Rodan, S.	1998	X	X	X	X			X
Khurana, A., Rosenthal, S.R.	1998	X		X				X
Lane, P. J., & Lubatkin, M. (1998).	1998			X	X	X	X	
Lane & Lubatkin 1998	1998			X	X	X	X	X
Dyer, J. H., & Singh, H. (1998).	1998				X	X	X	X
Koza & Lewin 1998	1998			X		X	X	X
Brown, S.L., Eisenhardt, K.M.	1997		X	X		X		
Grant, R.M.	1996					X	X	X
McKeon, T.	1996		X	X	X			X
Szulanski	1996		X		X		X	X
Mowery, Oxley, & 1996	1996		X	X			X	
Levinthal, D. A., & March, J. G.	1993		X				X	X
Garvin, D.A.	1993	X	X				X	
Amabile, T.M.	1993	X		X				
Normann, R., Ramírez, R.	1993	X	X			X		
Kaplan, R.S., Norton, D.P.	1992		X		X	X		X
Cohen, W. M., & Levinthal, D. A. (1990)."	1990		X				X	

4 Research Gaps & Research Objectives

	RATIONALE & QUESTIONS	ANSWERS FROM LITERATURE	LR OUTCOMES	JUSTIFICATION FOR	ACTION
1	*Which are Enable of Innovation in companies?*	Innovation capital ARE enablers of Innovation	<u>INNOVATION ACTIVITY (IA)</u> Gracioli et all, 2013), 1) Human Intellectual Capital 2) Relational Capital 3) Structural Capital Roper et all, 2012, 4) Innovation Value chain	Several studies exist about Innovation framework with capabilities, but these have contextual and methodological differences, very few have Innovation activity with Innovation value chain, as Innovation capital.	COMPONENTS OF MODEL Scope for developing the component level measurement of Innovation capabilities, with their Activities, Absorptive Capacity (with Realized capacities, Potential capacities of Organisational knowledge) for Innovation.
		(Gracioli et all, 2013, Bontis, N, 1998, Eisenhardt & Martin, 2000, Amabile, 1996, Tonial, G, 2019) (Chen, 2017, Gracioli et all, 2013, Vatamanescu, 2016, Moran, P., 2005) (Gracioli et all, 2013, De Pablos, 2004, Gracioli et all, 2012, Chang, C. M.,2016, Kamaluddin, 2009, Evans, S., 2017) (Roper, S., & Arvanitis, S., 2012, Fjeldstad, 2018)			
		Knowledge and Learning is also part of Innovation	**<u>ABSORPTIVE CAPACITY (AC)</u> (Cohen and Levinthal., 1990, Kim, 1998) Camisón and Forés (2010)**		
		(Wang and Han,2011, C. Lin, Wu, Chang, Wang and Lee,2012, Adams, 2006, Camison, 2019, Tsai, 2001, Damanpour, 2017, Pefc, 20210)			
		<u>INNOVATION OUTCOME</u> 1. Innovation is generated and later adopted. Innovation outcome during generation, created before dissemination (Watts, R. J., 1998, King, 2006, Roger, 1998). 2. Innovation outcome to the diffusion of innovation or acceptance of innovation has a series of stages (Santos et al., 2018, Evanschitzky, 2012).	**There is a lack of indicators for the assessment in the early development stages. (Evanschitzky, 2012)**	**INNOVATION PERFORMANCE OUTCOME - for Product and Process innovation and strength of linkages for Influence.**
		(Watts, R. J., 1998, King, 2006, Roger, 1998). (Santos et al., 2018, Evanschitzky, 2012). Evanschitzky, H., Eisend, M., Calantone, R. J., & Jiang, Y. (2012). Watts, R. J., Porter, A. L., & Newman, N. C. (1998), Coates, V., Farooque, M., Klavans, R., Lapid, K., Linstone, H. A., Pistorius, C., & Porter, A. L. (2001), King, S. F., & Burgess, T. F. (2006), De Sousa Jabbour, A. B. L., Jabbour, C. J. C., Foropon, C., & Godinho Filho, M. (2018), Watts, R. J., & Porter, A. L. (1997), Srivastava, S., & Misra, M. (2014), Duwe, D., & Spath, D. (2019)			
2	***How are Innovation and Innovation***	**Innovation is a practical construct with a beneficial**	**<u>PERCEPTION STUDIES</u> For Innovation, the framework defines knowledge structure**	**Organisational Studies have quantified organizational-**	**<u>FOR PERCEPTUAL STUDY</u> Hence the need to study employees'**

	enablers perceived within a company?	outcome & Innovation is a lower-order concept to Organizational Change (Damanpour, 2017)	as composed of learning philosophy, strategic direction, and trans functional beliefs within an organization. (Siguaw, 2006, Szabo, 2013).	level traits by studying a set of employees who exhibit behavioral patterns. The behaviors exhibited by employees are the patterns exhibited as a phenomenon being studied within the Organization. Gunday et al., 2007; Sawang, S. (2011). Damanpour et al., 2017; Szabo et al., 2013)	perception of the enablers of Innovation & innovation capability
		(Gunday et al., 2007; Sawang, S.,2011, Damanpour et al., 2017; Szabo et al., 2013, Kianto, 2016, Dawes, 2000; Tsai, 2002, Joseph L. Balloun, 2011). (Kianto, 2016, Dawes, 2000; Tsai, 2002, Joseph L. Balloun, 2011).			
3	*3.To what extent is the set of Innovation enablers have capabilities (a framework) that are significant and supportive to Innovation outcomes?*	Innovation framework as a set of enablers -----> Exhibit Innovation capability -----> required to sign and supported (Measured)----> innovation outcome	MEASUREMENT for Significant and supportive Component level studies –For Innovation capability. (Adopted for this study) (Luthy, 1998, Williams, 2000 for different types of methods). The adopted method is from various scales for Component studies	Component level measurement of Innovation in several studies and as methods for measuring innovation differ. This also includes the study by Damanpour, adopted for definition of Innovation, there is a contextual and methodological difference to the proposed measurement as in this study. (Kim, 2015, Damanpour, 2018)	MEASUREMENT Scope for developing a measurement instrument for Innovation measurement for Innovation Capability and Activity for Innovation
			(Kim, 2015, Damanpou r, 2018, (Luthy, 1998, Williams, 2000, Gracioli, 2008, (Gracioli et all, 2013, Bontis, N, 1998, Eisenhardt & Martin, 2000, Amabile, 1996, Tonial, G, 2019) (Chen, 2017, Gracioli et all, 2013, Vatamanescu, 2016, Moran, P., 2005) (Gracioli et all, 2013, De Pablos, 2004, Gracioli et all, 2012, Chang, C. M.,2016, Kamaluddin, 2009, Evans, S., 2017) (Roper, S., & Arvanitis, S., 2012, Fjeldstad, 2018)		
			Innovation Framework	Framework adapted from	Innovation Capability and

		of Enablers to exhibit Competencies	Anderson et al., 2008 and adapted for IVC from Roper, 2008 with AC from Camisón and Forés (2010)	Activity for Innovation for Posture and propensity
		(Bass, 1969) (Damanpour, 1996). (Frambach & Schillewaert, 2002) (Subramaniam, 2005) (Hekkert, 2007) (Stone, 2008) (Sánchez, 2009) (Stilgoe, 2013) (Anderson, 2014) (Kim, 2015) (Hartono, 2015) (Lendel et al., 2015) (Cassol et al., 2016) (Damanpour, 2017)		

Research Gap

1) Several studies exist about Innovation framework with capabilities, but these have contextual and methodological differences, very few have Innovation activity as part of capabilities. The components are IA, AC, Innovation as perceived.

   Scope for developing component level studies of Innovation Activities, Absorptive Capacity for Innovation performance.

2) Innovation is an abstract concept and there usually are differences in perception of Innovation capabilities within the framework, by individuals involved in innovation activities.

   Hence the need to study employees' perception of the enablers of Innovation as Innovation Activities, Absorptive Capacity for Innovation performance.

3) There measurement of Innovation in several studies and as methods for measuring innovation differ. This also includes the study by Damanpour, adopted for definition of Innovation, there is a contextual and methodological difference to the proposed measurement as in this study.

   Scope for developing a measurement instrument for Innovation Activity, Absorptive capacity for Innovation performance.

4.1 Objectives

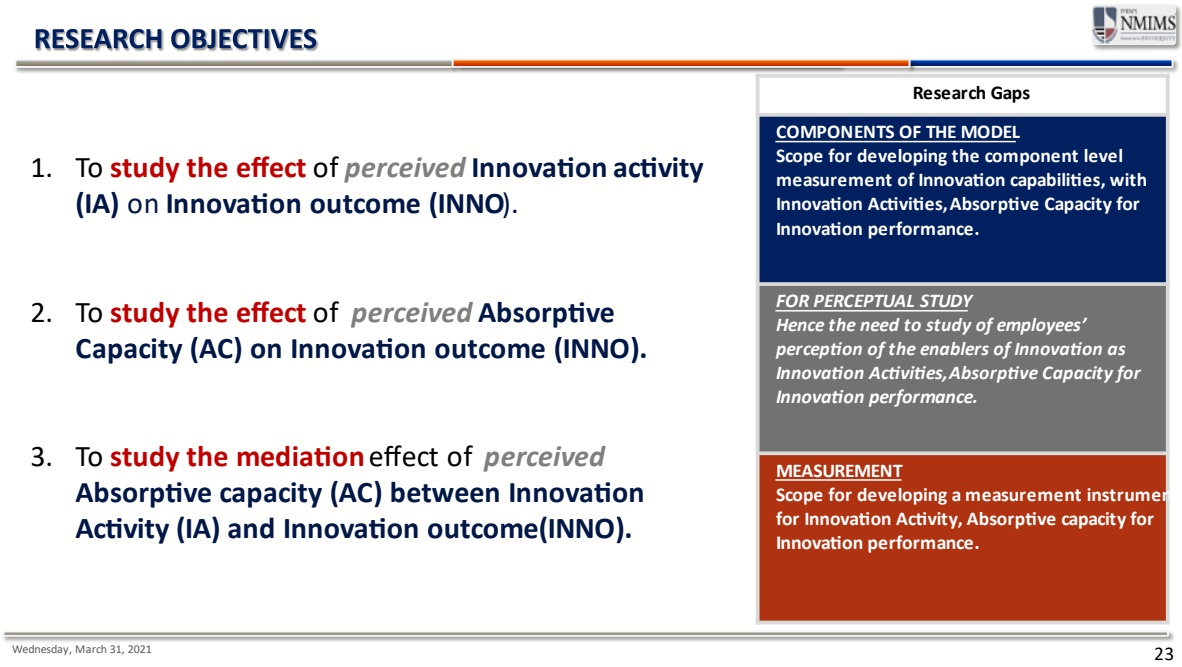
Consideration for the study

The study is about **Innovation framework** of composed of resources as enablers **carrying out Innovation activity**.

- Innovation enablers for this study are resources for **Innovation Activity, Absorptive Capacity for performance outcome of Innovation**.
- The study is **perceptual; by individuals as employees**. The respondents' perception of Innovation within Large Organization for Innovation performance of Product & Process Innovation.
- The **influences are expressed through Interactions between Innovation Activity** and Absorptive capacity to give Innovation performance (as Product or Process).and displayed by the strength of linkages hypothesized, and analyzed in inferential statistics.
- The **selected Large Companies, with criterion** of having IPR or Collect royalty fees or have R&D spending. The employees have a general idea about the concept of innovation as they are exposed to the processes of corporate Innovation.
- Emergent patterns of innovations within an organization especially among large service firms **(i) within the Organization –Considered here** (ii) specialized R&D units and (iii) Consultants or Specialized expertise (iii) Entrepreneurial ventures (iv) Supplier driven (v) Network Driven. Here consideration is to the first option. Innovations and an orientation toward innovativeness are inspired by the firm's strategy. (Miles, 2001, Sapprasert, K., & Clausen, T. H, 2012

4.2 Objectives are as follows.

1) To study the perceived effect of Innovation activity (IA) on Innovation Performance (INNO).
2) To study the perceived effect of Absorptive Capacity (AC) of an organization on Innovation Performance (INNO).
3) To study the mediation effect of perceived Absorptive capacity (AC) between Innovation Activity (IA) and Innovation performance (INNO).


RESEARCH OBJECTIVES
1. To study the effect of perceived Innovation activity (IA) on Innovation outcome (INNO).
2. To study the effect of perceived Absorptive Capacity (AC) on Innovation outcome (INNO).
3. To study the mediation effect of perceived Absorptive capacity (AC) between Innovation Activity (IA) and Innovation outcome(INNO).
Research Gaps
COMPONENTS OF THE MODEL
Scope for developing the component level measurement of Innovation capabilities, with Innovation Activities, Absorptive Capacity for Innovation performance.
FOR PERCEPTUAL STUDY
Hence the need to study of employees' perception of the enablers of Innovation as Innovation Activities, Absorptive Capacity for Innovation performance.
MEASUREMENT
Scope for developing a measurement instrume
for Innovation Activity, Absorptive capacity for
Innovation performance.
Wednesday, March 31, 2021
23

4.3 Hypotheses

Direct Effects

[1]. H_1: There is a significant positive relationship between perceived Innovation Activity (IA) and perceived Innovation Outcome (INNO).

[2]. H_2: There is a significant positive relationship between perceived Absorptive Capacity (AC) and perceived Innovation Outcome (INNO)

[3]. H_3: There is a significant positive relationship between perceived Innovation Activity (IA) and perceived Absorptive Capacity (AC).

Mediating Effects

[4]. H4: Absorptive Capacity (AC) has a mediating effect between the perceived Innovation Activity (IA) and perceived Innovation Outcome (INNO)

Perceived Influence on INNO

(INNO -Innovation Outcome)

[5]. H5a: There is a significant positive relationship between perceived Human Intellectual Capital (HC), and perceived Innovation Outcome (INNO).

[6]. H5b: There is a significant positive relationship between perceived Structural Capital (STR), and perceived Innovation Outcome (INNO).

[7]. H5c: There is a significant positive relationship between perceived Customer Relational Capital (REL) & perceived Innovation Outcome (INNO).

[8]. H5d: There is a significant positive relationship between perceived Innovation Value chain (VAL) and perceived Innovation Outcome (INNO).

Perceived Influence of enablers of IA on AC

(Innovation Activity (IA) on Absorptive Capacity (AC))

[9]. H5e: There is a significant positive relationship between perceived Human Intellectual Capital (HC) and perceived Absorptive Capacity (AC).

[10]. H5f: There is a significant positive relationship between perceived Structural Capital (STR), and perceived Absorptive Capacity (AC).

[11]. H5g: There is a significant positive relationship between perceived Customer Relational Capital (REL), and perceived Absorptive Capacity (AC).

[12]. H5h: There is a significant positive relationship between the perceived Innovation Value chain (VAL) and perceived Absorptive Capacity (AC).

4.4 Scope of the study

- The study has taken the considered several definitions of Innovation.
- The study is under Resource based view and Knowledge-based view.
- Organization performance in terms of Innovation outcomes, Innovation activities, and competency building in Absorptive capacity as elements of the study.
- And a concept map has been derived using the above considerations.
- This study has compared other measurement techniques for the method, its outcome and discussed how the perspective differs for the outcomes. For this study, the Innovation value chain has been considered.
- For an Innovative firm by nature, activity influences innovative performance.
- The parameter that defines the Methods or process that facilitate innovative practices within the framework.
- The innovative nature of companies comes forth by innovation activity for which the parameters exist, thus capturing the innovative performance of the company.
- The study is about Innovation framework of composed of resources as enablers carrying out Innovation activity.
- Innovation enablers for this study are resources for Innovation Activity, Absorptive Capacity for performance outcome of Innovation.
- The study is perceptual; by individuals as employees. The respondents' perception of Innovation within Large Organisation for Innovation performance of Product & Process Innovation.

- The influences are expressed through Interactions between Innovation Activity and Absorptive capacity to give Innovation performance (as Product or Process).and displayed by the strength of linkages hypothesized, and analyzed in inferential statistics.
- The selected Large Companies, with criterion of having IPR or Collect royalty fees or have R&D spending. The employees have a general idea about the concept of innovation as they are exposed to the processes of corporate Innovation.
- Emergent patterns of innovations within an organisation especially among large service firms (i) within the Organisation –Considered here (ii) specialized R&D units and (iii) Consultants or Specialised expertise (iii) Entrepreneurial ventures (iv) Supplier driven (v) Network Driven. Here consideration is to the first option. Innovations and an orientation toward innovativeness are inspired by the firm's strategy. (Miles, 2001, Sapprasert, K., & Clausen, T. H, 2012

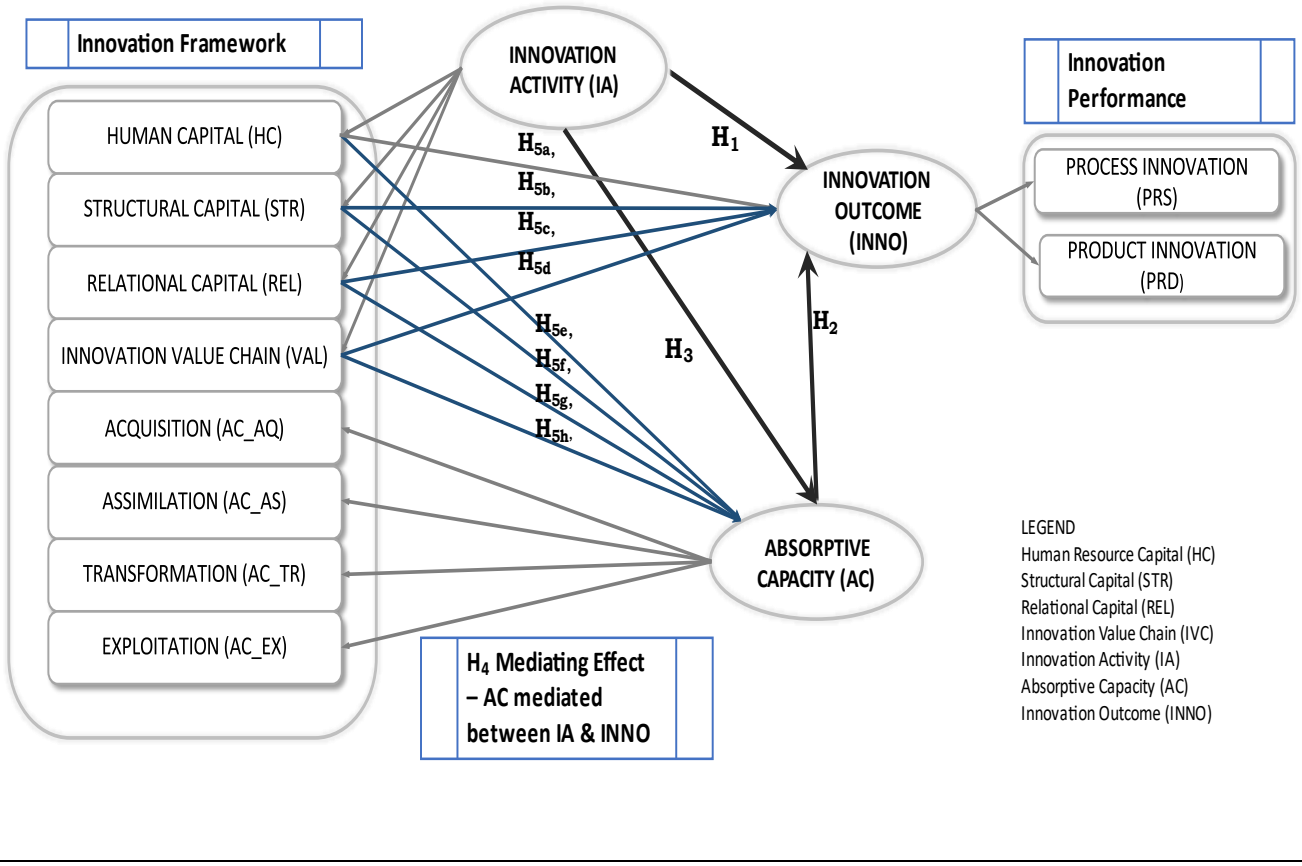


Figure 3: Theoretical Model with hypothesis mapping.

4.5 Concept Map

Key theories used and seven variables were hypothesized enablers and as antecedents of innovation with Innovation activity with Human Intellectual capital, Relational, and Networking capital, Structural capital with the Innovation value chain.

This is aided by Absorptive capacity for an outcome in terms of "two types of innovation" that are under study in the context of product innovation and process innovation. for the innovation success outcome that leads to innovation success as perceived by employees as individuals. This led to the formation of the theoretical model that forms the basis for analysis. For testing of direct effects of IA, AC and INNO is depicted in the figure. For mediating effect of AC, which mediates between Innovation activity and Innovation.

There are multiple antecedents of Innovation and the influence will attempt to establish these relationships between variables are considered and an Indirect effect of the capabilities is taken for study. Innovation Activity (IA) includes Human Intellectual Capital, Structural Capital, Relational Capital, and Innovation Value Chain. The following are the Operationalising the constructs with a theoretical and operational definition for the following

1) Innovation Activity (IA)
2) Absorptive Capacity (AC)
3) Innovation Outcome (INNO)

5 Research Methodology

5.1 Research Design

This study is a descriptive and explanatory study of the Perception of these components or enablers on innovation success outcomes, using inferential statistics, for deciphering the perception of individuals working for large Indian companies. The analysis is carried out using descriptive statistics and Inferential statistics. Within the inferential statistics, the hypothesis is tested using the methods using dimension reduction, confirmatory factor analysis, and structural equation modeling.

The study identifies the important aspects as:

1. *The capabilities are expressed through Innovation Activity of capital assets as Human Intellectual capital, Relational Capital. Structural Capital, Innovation value chain, and Absorptive capacity for Innovation outcome as Product & Process (or Service).*
2. *Innovation framework of Capability features is as perceived by individuals as employees.*
3. *Innovation within an organization under study is of Process Innovation & product innovation.*
4. *The Influence of the Innovation framework (i.e., the resources and Asset's exhibit capabilities) on the Innovation performance, as an outcome, is displayed by the strength of linkages explained, hypothesized, and analyzed in inferential statistics.*
5. *The respondents' perception of Innovation within Large Organisation for Innovation performance of Product & Process Innovation (*Other types. (i) specialized R&D units and (ii) Specialised expertise in problem-solving for clients as consultants or applied researchers, (iii) Entrepreneurial ventures (iv) Externally driven as supplier drove (v) Network Driven are not in the scope of this Study as their primary KRA is Innovation)

The Research Design and analysis is done in the following steps

1. Data checks, cleaning, and readiness- using Excel
2. Descriptive Statistics -using SPSS
3. EFA for check of integrating different scales – SPSS
4. CFA – Using AMOS and SPSS
5. SEM -Using AMOS and SPSS

The study of Innovation orientation with components as Human capital, Relational capital, and structural capital. These components with the process of innovation within the Innovation value chain are the Innovation activity. The performance of Innovation activity leveraging capability and knowledge as Absorptive capacity has an outcome of Innovation performance. The model shows the component interaction which is identified from the review of literature for analysis. The interaction and Perception of all these parameters were tested with direct, mediating, and indirect effects as hypothesis statements.

A model thus identified shows to have a fair fitment and assists in the evaluation of dominant patterns for determinants of enablers and Innovation performance.

The major finding is that the absorptive capacity plays a major role in the process of innovation as a capability built up as absorptive capacity partially mediates the Innovation success. The model tests the perception of Innovation for the innovation capital resources and their interaction and effects for innovation success. These give the levels of Perception as a measure. Each of the components with its degree of Perception for innovation.

5.2 Operationalizing Constructs

Operationalizing constructs and their related definitions are on account of the logical positivistic epistemology adopted in the early 20th century, where the theoretical concepts are meaningless unless a conclusive counterpart exists for the objective exactly and we have some reflective entity and a way to measure it, where everything else, is in the realm of metaphysics. "Although 6 this extremist version of positivism has given way to scientific realism (where, among other things, all measurement is regarded as fallible and conclusions as tentative, pending falsification), it has made a trend in social science research for empirical studies" (McKelvey, 1997).

5.2.1.1 Definition: Intellectual Capital (IC)

Theoretical Definition of IC

Intellectual Capital refers to the "explicit and tacit knowledge base of a company, the Intellectual Capital is considered to have three dimensions, namely, Human Capital, Structural Capital, and Customer Relational Capital (Gracioli, Godoy, Lorenzett, and Godoy, 2012).

a) Human Capital refers to the quality of human talent at the disposal of the firm,

b) Structural Capital refers to the 'codified knowledge base' or the tangible knowledge base, and
c) Customer Relational Capital refers to intangible knowledge created through interactions with customers and other partners

Operational Definition of IC

Intellectual Capital has been operationalized as the combination of Human Capital and Intellectual Assets, recognizing the value creation role of the former, and the value extraction. It has been adopted from Gracioli, Godoy, Lorenzett, and Godoy, 2012).

5.2.1.2 Definition: Innovation Value Chain (VAL)

Theoretical Definition of Innovation Value Chain (VAL)

The innovation value chain (IVC) adapted from the operationalization of the concept is from Roper, S., & Arvanitis, S. (2012) for "Innovation Value Chain, divides the innovation process into three separate links or activities: knowledge gathering, knowledge transformation, and knowledge exploitation". In terms of Knowledge gathering, "the first link in the innovation value chain relates to firms' activities in sourcing the knowledge inputs for innovation (Frenz and Ietto-Gillies, 2009). Specifically, we identify five alternative routes through which firms may source the knowledge inputs for innovation reflecting the potential for both internal knowledge creation and external knowledge acquisition: in-house R&D (Shelanski and Klein, 1995); forward linkages to customers (Love and Mansury, 2007); backward links to either suppliers or external consultants (Horn, 2005; Smith and Tranfield, 2005); horizontal linkages to either competitor or through joint ventures (Gnyawali and Park, 2011; Hemphill, 2003; Link et al., 2005); and, linkages to universities or other public research centres (Del Barrio-Castro and Garcia-Quevedo, 2005). Firms' need to engage in either new in-house knowledge creation or external knowledge sourcing is likely to depend on existing knowledge resources (Mol et al., 2005). There is also a potential for complementary or substitute relationships between new knowledge derived from these five different sources (Cassiman and Veugelers, 2006; Love and Roper, 2004; Veugelers and Cassiman, 1999). The more R&D is done in-house the more knowledge is generated internally, and the less external knowledge is required. In what follows we begin from this latter position, anticipating that firms with stronger pre-existing knowledge resources are less likely to need to engage in either new in-house knowledge creation through R&D or external knowledge sourcing" (Schmidt, 2010).

Operational Definition VAL

The final operationalization of the concept is from Roper, S., & Arvanitis, S. (2012) for Innovation Value Chain which is composed of all the above operationalization of scales which comprises of product and process throughput, productivity as value-added per employee, regulatory barriers, financial support, employment, capital intensity, workforce education. This has been adopted from Roper, S., & Arvanitis, S. (2012) for Innovation Value Chain

5.2.1.3 Definition: Innovation Activity (IA)

Theoretical Definition of IA

Innovation activity (Stone, 2008) involves activity to create economic value. Fundamental to the concept of innovation is the innovator's intent to create something of economic value, the mechanism through which the consumer obtains the benefits of innovation and the innovator obtains the return, and thus it is so important to the innovative process. And activities carried out as Innovation Activities as Research and development, Design & Prototyping, Pre-production activities, Training and development, market research would constitute some of the activities (Stone, 2008). The entities engaged in doing these are the human intellectual capital with the aid of Structural and administrative setups, relational and networking and alliances and process-oriented structures, linkages, and alignment as the value chains. Thus, the Innovation activities are reflective construct from the (i) Human Intellectual capital, (ii) Relational capital, and (iii) Structural capital which is in process of creation with (iv) Innovation Value Chain.

It is the action carried out to innovation that is difficult to capture although it is at the core of the Innovation process its fundamental nature and understanding of the factors of innovation and the mechanisms through which innovation creates growth is most difficult to establish and measure. And there are no direct measures to find an empirical measure of the innovative activity itself.

Human capital in Companies is "human capital as a critical input into all their activities but especially their R&D and innovation activities".

Organizational or structural capital "encompasses processes, databases, software, and organizational capabilities. Information technology systems are an especially critical part of organizational capital. It is difficult, however, to measure the value of information technology infrastructure because it enables the development of multiple commercial products. information technology systems are used to catalo, share, and manage new ideas".

Relational capital "refers to the relationships that firms have with external organizations involved in innovation, including technological development, prototype construction, and testing, market research, production, supply and distribution chains, and launch marketing. Relational capital also includes internal mechanisms for leveraging these relationships effectively "

Innovation Value Chain is composed of all the above operationalization of scales which comprises of product and process throughput, productivity as value-added per employee, regulatory barriers, financial support, employment, capital intensity, workforce education.

Operational Definition of IA

Innovation Activity IA is composed of scales from for Intellectual Capital is Human Intellectual Capital, Structural Capital, & Relational Capital from Gracioli, Godoy, Lorenzett, and Godoy (2012). Roper, S., & Arvanitis, S. (2012) for Innovation Value Chain from Roper, S., & Arvanitis, S. (2012).

5.2.1.4 Definition: Innovation of Absorptive Capacity (AC)

Theoretical Definition of Absorptive Capacity (AC)

The Absorptive capacity is the learning, leveraging, and exploitation capacity of an organization. critical factors that serve as antecedents of innovation, including employee voice and knowledge sharing, which in turn lead to creativity and innovation. The processes for absorbing external knowledge become an essential element for innovation in firms and in adapting to changes in the competitive environment. Here the definition of the construct specifying its theoretical domain and dimensionalization, and validation of the construct is done using literature on absorptive capacity through the creation and validation of two scales, justified with a thorough analysis of the literature, to measure the key components of the absorptive capacity construct: potential and realized absorptive capacities. This is done using Camisón and Forés (2010) For Absorptive capacity

Operational Definition of AC

The scale consists of "(i) Acquisition capacity is a firm's ability to locate, identify, value, and acquire external knowledge that is critical to its operations adapted. (ii) Assimilation: Assimilation capacity refers to a firm's capacity to absorb external knowledge. This capacity can also be defined as the processes and routines that allow the new information or knowledge acquired to be analyzed, processed, interpreted, understood, internalized, and to develop and

refine the internal routines that facilitate the transference and combination of previous knowledge with the newly acquired or assimilated knowledge. (iii) Transformation may be achieved by adding or eliminating knowledge, or by interpreting and combining existing knowledge in a different, innovative way and the final stage (iv) Application: Application or exploitation capacity refers to the organizational capacity based on routines that enable firms to incorporate acquired, assimilated and transformed knowledge into their operations and routines not only to refine, perfect, expand and leverage existing routines, processes, capabilities and knowledge but also to create new operations, capabilities, routines, goods, and organizational forms".

Scale adopted from Camisón and Forés (2010) For Absorptive capacity and Cassol, A., Gonçalo, C. R., & Ruas, R. L. (2016). Redefining the relationship between intellectual capital and innovation: The mediating role of absorptive capacity

5.2.1.5 Definition of Innovation Outcome (INNO)

Theoretical Definition of Innovation Success (INNO)

Counting research and development publications and patent activity can help generate competitive technical intelligence. Combining such counts with content analyses oriented toward "innovation success factors" can greatly enrich the intelligence value. The Outcome is taken for definition adapted for Innovation and the scale is for Product and Business Process Innovation from the scale Stoeckicht and Soares (2012) for Innovation performance of Organization

Operational Definition of INNO

The scale for Outcome of Innovation Performance as success Indicator for the perceptive study is in terms of Process and Product innovation and it is adapted from Stoeckicht and Soares (2012) for Innovation Success Outcome for Product and Process Innovation for an Organization

5.3 Sample Design

Sector selection for growth. Used the reports from another study supporting these sectors. (i) Information and Communications Technology (ii) Banking and Financial Services & (iii) Pharmaceuticals and Healthcare. For Sector Selection Reports of WIPO & CTIER and more

references used. The selection sector/ Industry classification from NIC 2008 And CMIE Prowess database.

Large Companies Selected companies listed on BSE and NSE taken, these show growth &/or Innovative activity or awareness. Population – All companies who have R&D spending, Innovation for new products and Services, Royalty earned as a visible indicator, and IPRs. So, the Criterion for selection of companies. (a) With R&D spending (b) intellectual property IPR and (c) royalty earning. (iv) Growth for the economy as the banking sector for transformation within the e-commerce area.

The sampling Method is *Non-Probabilistic Convenience Sampling*. With *Unit of observation and analysis - Individuals as Employees* of the selected companies and *expected Sample Size 550* (Wolf E.J., 2013; Hair et al.,2010))

Considerations are as follows

1. *Innovation emergent patterns* the most common, especially are with an (i) among large service firms, (ii) specialized R&D units and (iii) Specialised expertise in problem-solving for clients, (vi) Entrepreneurial ventures (v) Externally driven as supplier drove (v) Network Driven). Options of Specialised expertise and Entrepreneurial ventures are dedicated for Innovation and Externally driven as supplier driven and Network In organizations are externally driven. This brings a question that primarily how to do big organizations functions, they would help employees with a mind-set and opportunities for, there is not an R&D department. Innovations and an orientation toward innovativeness are inspired by the firm's strategy. Research is seen as a widely diffused task (many members of staff contribute toward developing innovative solutions). Development, which typically requires more explicit effort and time, is undertaken by ad hoc project teams. (Miles, 2001, Sapprasert, K., & Clausen, T. H, 2012)

2. Population – All companies who have R&D spending, Innovation for new products and Services, Royalty earned as a visible indicator, and IPRs and have Growth for the economy as the banking sector for transformation within the e-commerce area.

5.4 Research tool

The research tool is designed with items on a 7-point Likert scale.

- The Instruments for Innovation Activity (IA)-Innovation Activity IA scales is Intellectual Capital is Human Intellectual Capital (Gracioli, Godoy, Lorenzett, and Godoy, 2012), Structural Capital (Gracioli, Godoy, Lorenzett, and Godoy, 2012)
- Relational Capital (Gracioli, Godoy, Lorenzett, and Godoy, 2012)
- Innovation Value Chain (IVC) (Roper, S., & Arvanitis, S.,2012).
- Absorptive Capacity (AC) -The Absorptive capacity is the learning, leveraging, and exploitation capacity adapted from Camisón and Forés (2010).
- Innovation Outcome (INNO)- Adapted from Stoeckicht and Soares (2012) for Innovation Outcome for Product and Process Innovation for an Organization.

The research tool is designed with items on 7-point Likert scale.	***Items***
Innovation Activity (IA)-Innovation Activity (IA) instrument. 1) **Intellectual Capital is Human Intellectual Capital (**Gracioli, Godoy, Lorenzett, and Godoy, 2013) 2) **Structural Capital (**Gracioli, Godoy, Lorenzett, and Godoy, 2013) 3) **Relational Capital (**Gracioli, Godoy, Lorenzett, and Godoy, 2013) 4) **Innovation Value Chain (IVC**) (Roper, S., & Arvanitis, S.,2012).	44
Absorptive Capacity (AC) -The Absorptive capacity is the learning, leveraging, and exploitation capacity adapted from Camisón and Forés (2010).	13
Innovation Outcome (INNO)- Adapted from Stoeckicht and Soares (2012) for Innovation Outcome for Product and Process Innovation for an Organization.	8

A total of 65 Items. Please refer to the Annexure for the Research Tool in Annexure

The other aspects of the data collected show the following characteristic diversifications.

Table 13: Companies Selected from within Industry Population

Industries/ Companies-> (Total Number of Companies)	Total	Selected	Percentage
Banking and Financial Services	53	16	30.2%
Pharmaceuticals and Health care services	71	15	21.1%
Information Communication Technologies	40	14	35.0%
TOTAL	**164**	**45**	**27.4%**

Table 14: Responses by Senior, Middle level and Junior Management

Cadre -three levels within the management as Senior, Middle level, and Junior Management	(JM)	(MM)	(SM)	Grand Total	%
Financial Services (FS)	102	174	48	**324**	31%
Information and communications technology Companies (ICT)	149	158	52	**359**	34%
Pharmaceuticals and HealthCare Services (Pharma)	107	173	82	**362**	35%
TOTALS	**358**	**505**	**182**	**1045**	100%
PERCENTAGES	34%	49%	18%	100%	

Table 15: Management Level (Senior. Middle and Junior levels)

	JM	MM	SM	Tot. Emp.
General Manager			27	27
Vice President			4	4
Director			11	11
Chief officer			24	24
Sr Analyst			11	11
Sr Associate			2	2
Sr Consultant			28	28
Sr Manager			60	60
Sr Scientist			15	15
Analyst		33		33
Associate		16		16
Consultant		18		18
Manager		324		324
Scientist		13		13
Sr Engg		101		101
Jr Manager	12			12
Engineer	156			156
Executive	159			159
Clerk	26			26
Accountant	5			5
Grand Total	358	505	182	1045
	34%	49%	18%	

5.5 Data Collection

- More than 1184 collected, after cleaning used 1045 responses collected.
- Sent out was for 2100+ responses. (Response rate of 56%).

- Data Collection was carried out by visiting the companies over 18 months (prior appointment)
- The online method using google forms was Preferred mode. Offline also collected.
- Met 25 mid and top-level managers for detailed discussion to understand their perspectives.

6 Analysis and Findings

6.1 Descriptive Statistics

From the questionnaire, we have 65 variables in total with 57 independent and 8 dependent variables. The responses collected and retained for analysis are 1045 which complies with the responses.

i. No missing Data. For the data checks, there are no missing values remain. Analyzed in Descriptive statistics and checked for ensuring that in the selected samples there is no missing data.

ii. Non-Engaged responses- These were removed. We had ample samples after removal.

iii. Outliers -Much below 0.006%.

iv. Data Collection: This ensures the following entries are done by respondents are unique to one per email address and direct form filled. For the responses, the response also captures the email address, company name, and designation of each response with complete capture of all data points in the

v. Using a Likert 7-point scale[5]. Normality- Histograms obtained for all the variables. And the data is normal data collected by Likert scale. And Linearity- sufficiently present.

vi. The value of Skewness ranges from -.520 to -1.4 for an error of Skewness as 0.072 for all items. This is acceptable in relaxed rules for perceptive studies. And Kurtosis ranges from -.625 to 1.678 with a uniform standard error of 0.142 on all variables. While this might not conform to strict rules of normality, but lies in relaxed rules (3.3

[5] Carifio, J. and R. Perla. 2007. Ten Common Misunderstandings, Misconceptions, Persistent Myths and Urban Legends about Likert Scales and Likert Response Formats and their Antidotes. Journal of Social Sciences 2: 106–16.
Hair and Black

as the upper threshold) as suggested by Sposito (1983) as the upper threshold for normality. Further Acceptable values of skewness fall between − 3 and + 3 and kurtosis are appropriate from a range of − 10 to + 10 when utilizing SEM (Brown, 2006).

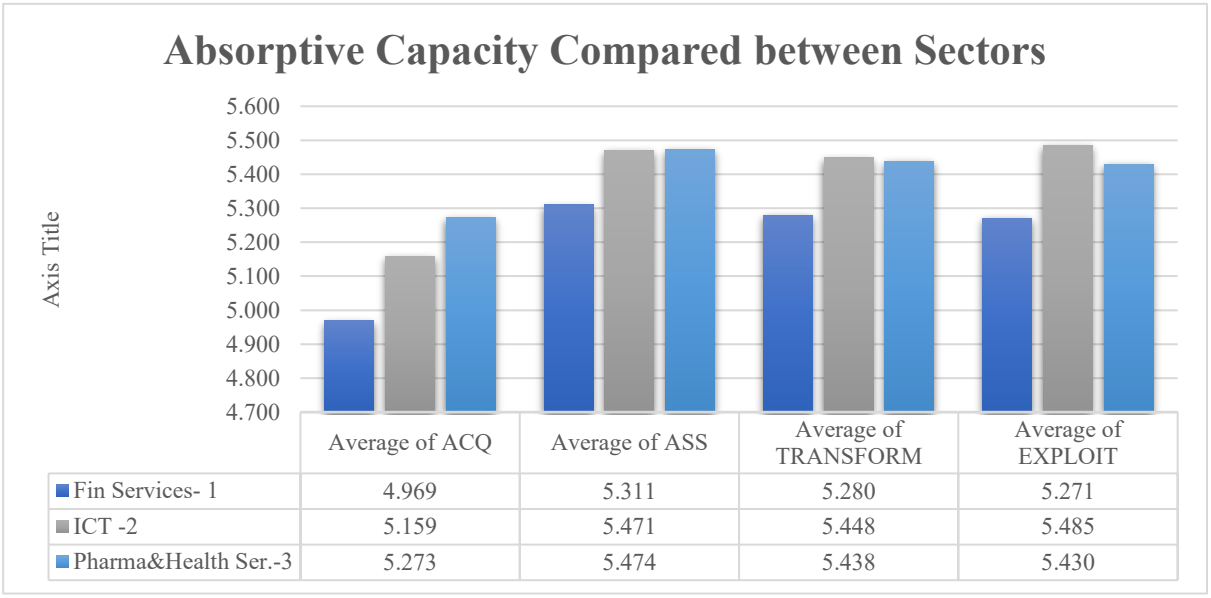
vii. Homoscedasticity-Due to the usage of the Likert scale, we have the distribution that gives a uniform distribution.

viii. An error can be further reduced if the sample size is much larger. The expected Sample size to Variables is 10:1. In the study, we have 15:1 which is a large Set. A larger sample size will diminish the error in your data Additionally, it is also to be noted that if the dataset has several high factor loadings with a score of greater than 0.7 then even a smaller sample size of say half the respondents or cases will be sufficient (Guadagnoli and Velicer 1988).

Sr	**Summary of Description of Test**	**Summary Outcomes**
1	Sample Size for Test Data	Adequate. (N=1045)
2	Descriptive statistics	Details in Annexure
3	Missing values - Nil	Nil
4	Deviation	Acceptable
5	Skewness	Acceptable levels
6	Kurtosis	Acceptable levels
7	Kolmogorov-Smirnova & SWT	Normality established

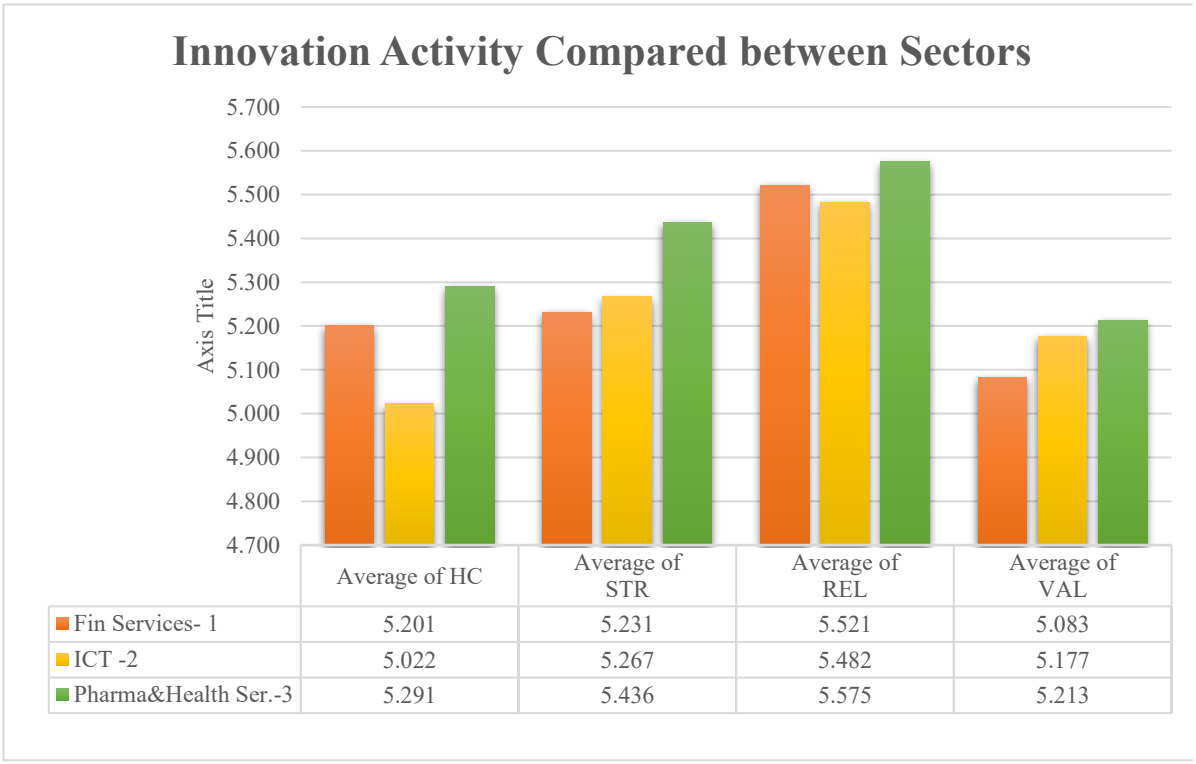
6.2 Sectorial Difference

Descriptive statistics, for Sectorial Difference. The difference between sectors for the Absorptive capacity is exhibited by the graph below and the difference in the Innovation Activity as seen in all three sectors is depicted below by the graph.



	Average of ACQ	Average of ASS	Average of TRANSFORM	Average of EXPLOIT
Fin Services- 1	4.969	5.311	5.280	5.271
ICT -2	5.159	5.471	5.448	5.485
Pharma&Health Ser.-3	5.273	5.474	5.438	5.430

Figure 4: Absorptive Capacity (AC) comparison across sectors



	Average of HC	Average of STR	Average of REL	Average of VAL
Fin Services- 1	5.201	5.231	5.521	5.083
ICT -2	5.022	5.267	5.482	5.177
Pharma&Health Ser.-3	5.291	5.436	5.575	5.213

Figure 5: Innovation Activity (IA) comparison across sectors

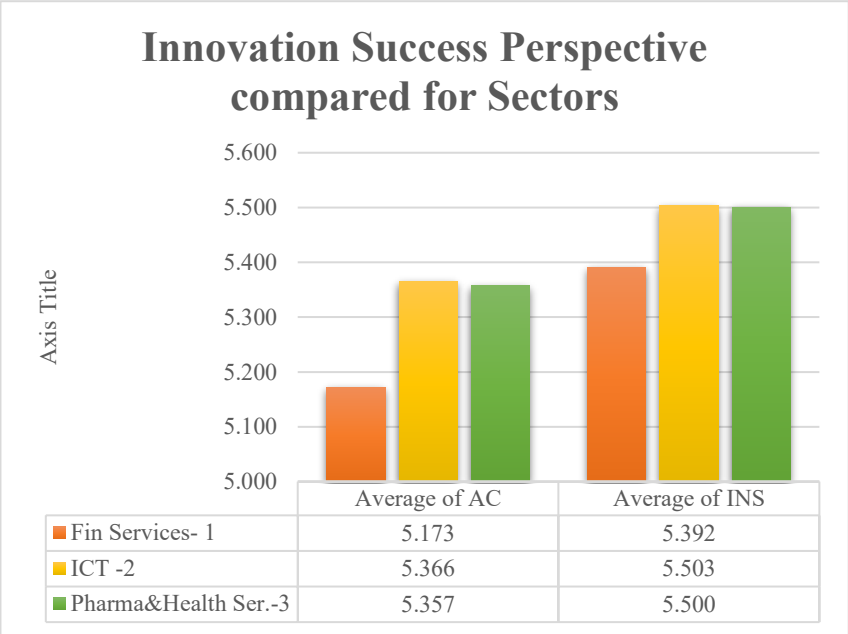


Figure 6: Innovation Performance (INNO) Comparison across sectors

Innovation Success perceived by the employees within the sector is depicted in the graph above. The Sectorial difference found in the first factor of Absorptive capacity is of the order of 0.36 on the scale of 7. Similarly, for Innovation activity, the difference is .22 to 7. And Outcome as performance is also of the order 0.21 on the scale of 7.

6.3 Perceived Effect of Indicators

6.3.1 Perception of Human Intellectual Capital Indicators

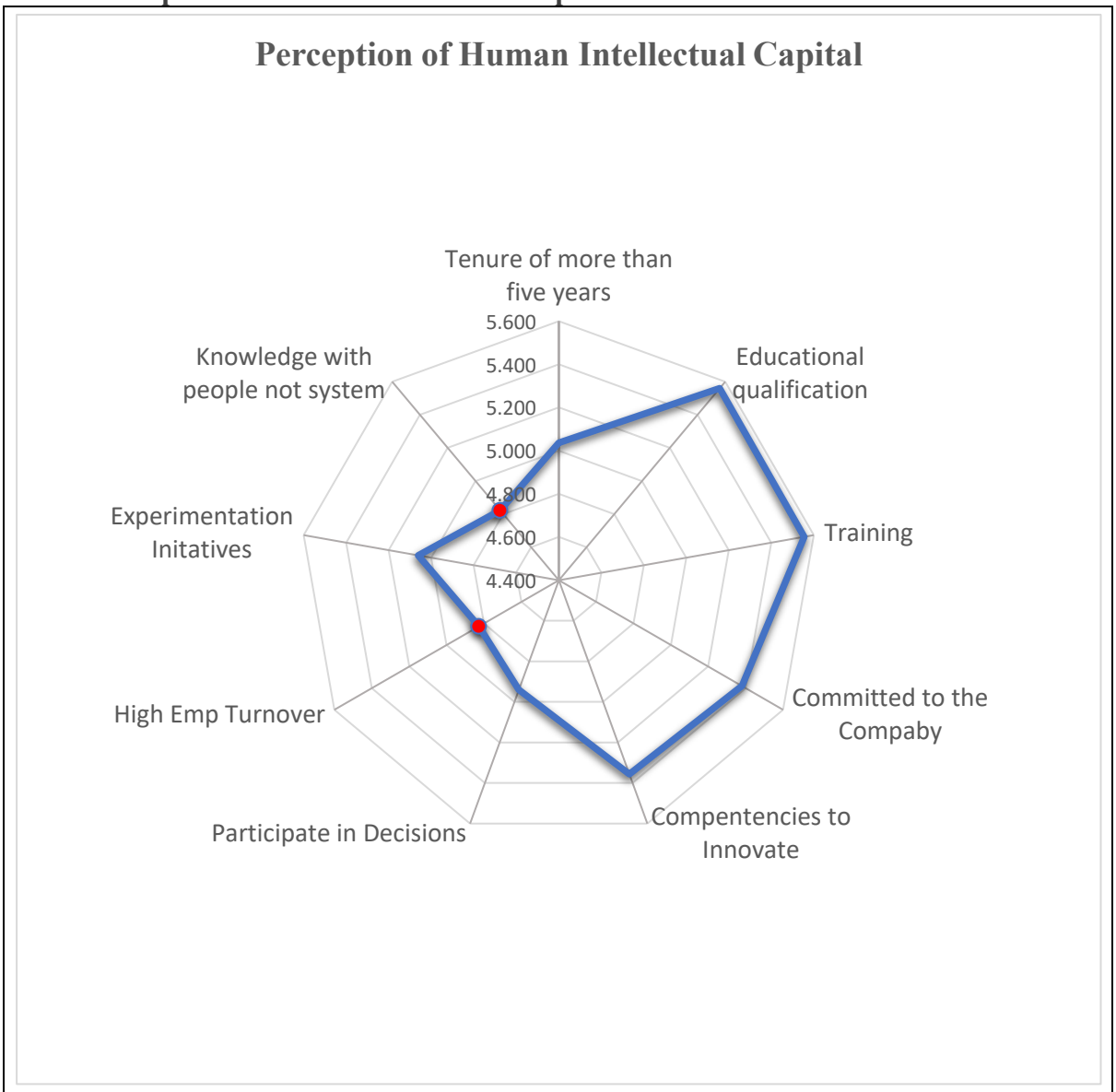
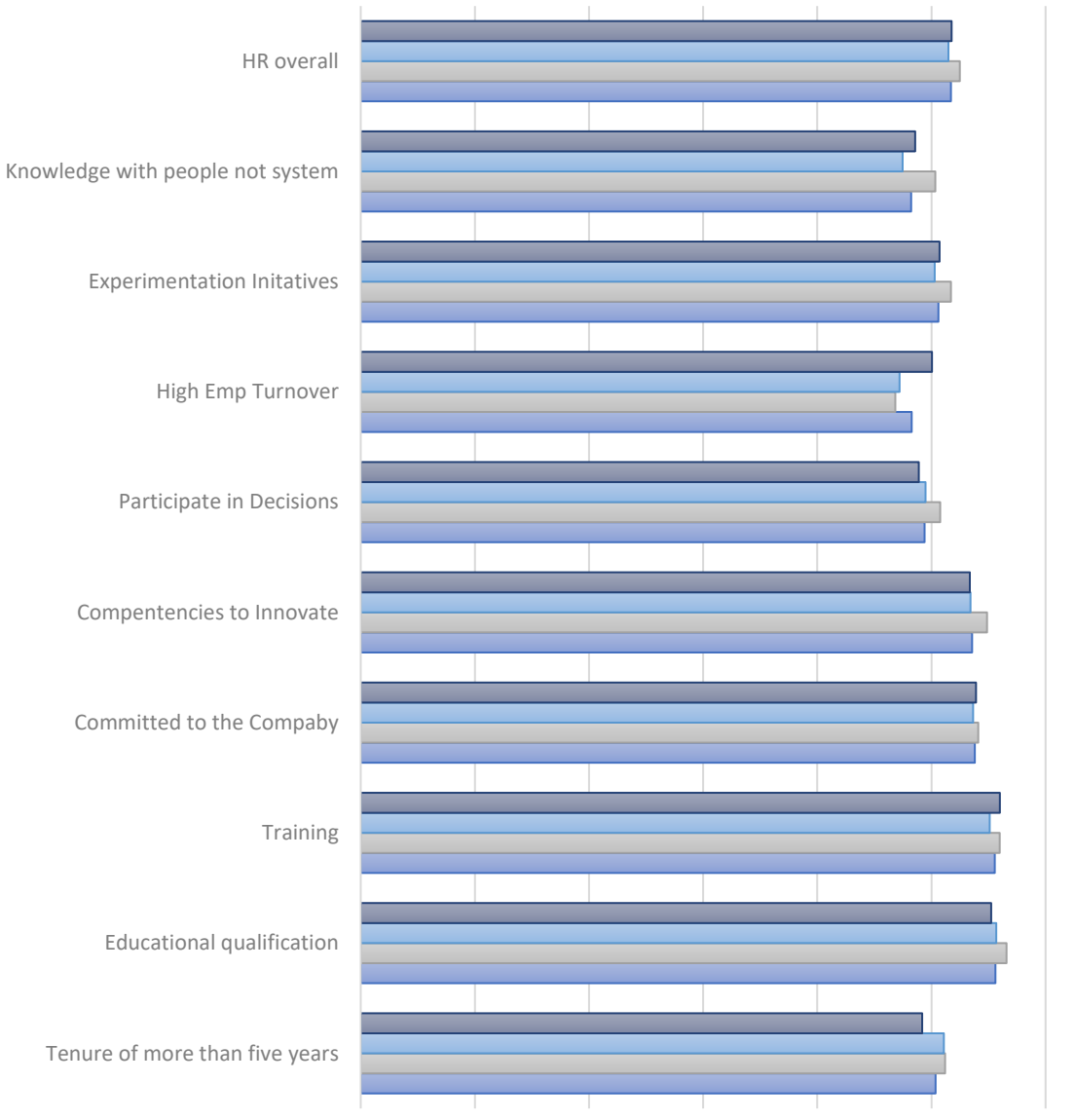


Figure 7:Perception of Human Intellectual Capital Aspects

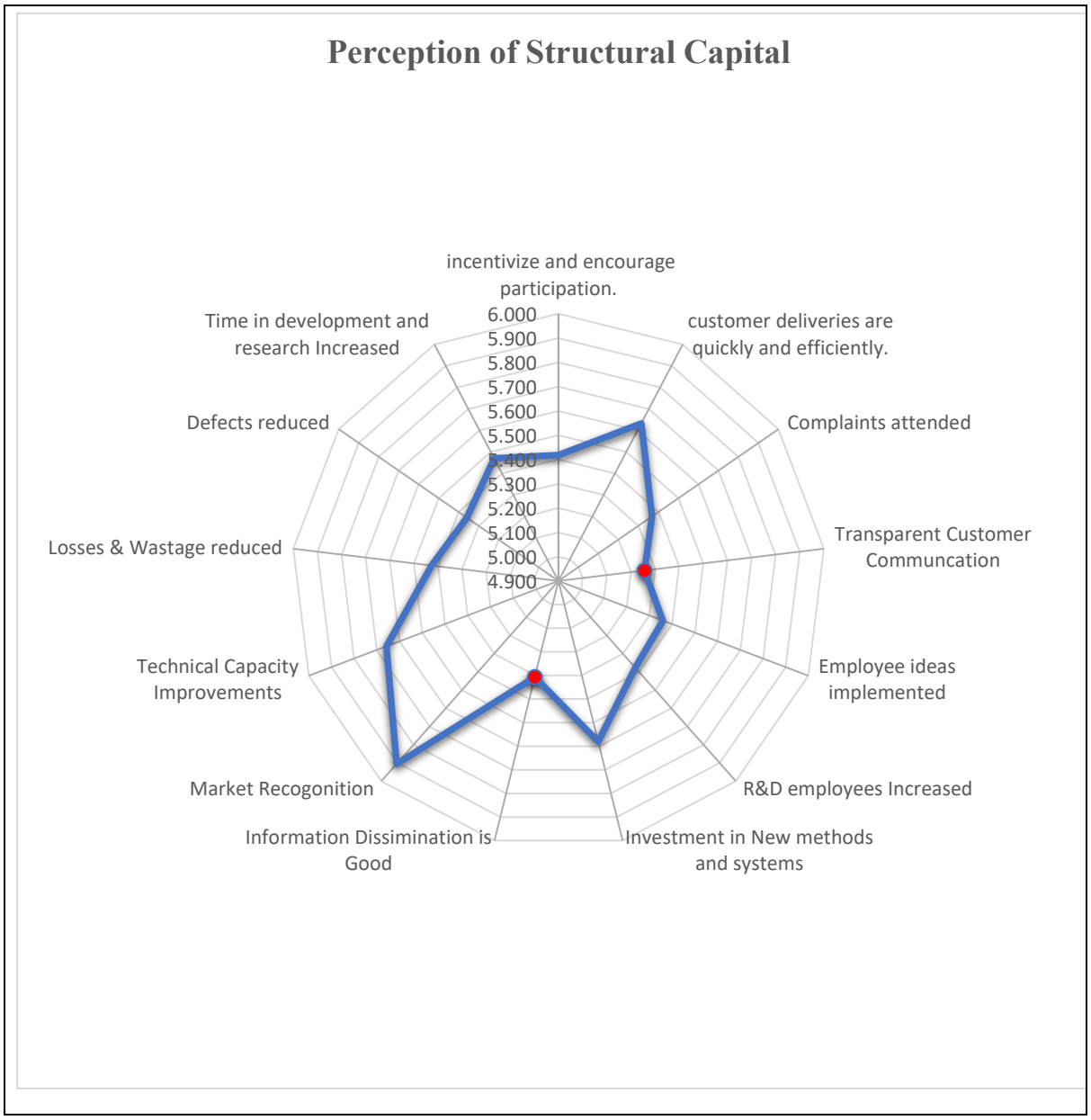
The weak areas are employee turnover and the knowledge within the organization is with people, if they leave critical knowledge leaves with them.



	Tenure of more than five years	Educational qualification	Training	Committed to the Company	Competencies to Innovate	Participate in Decisions	High Emp turnover	Experimentation Initatives	Knowledge with people not system	HR overall
Mngt Level 3	4.919	5.523	5.600	5.391	5.337	4.889	5.005	5.071	4.857	5.177
Mngt Level 2	5.109	5.568	5.511	5.365	5.342	4.948	4.721	5.029	4.748	5.149
Mngt Level 1	5.120	5.658	5.598	5.410	5.487	5.077	4.684	5.171	5.034	5.249
Total Avarage	5.036	5.561	5.555	5.380	5.356	4.940	4.827	5.061	4.822	5.171

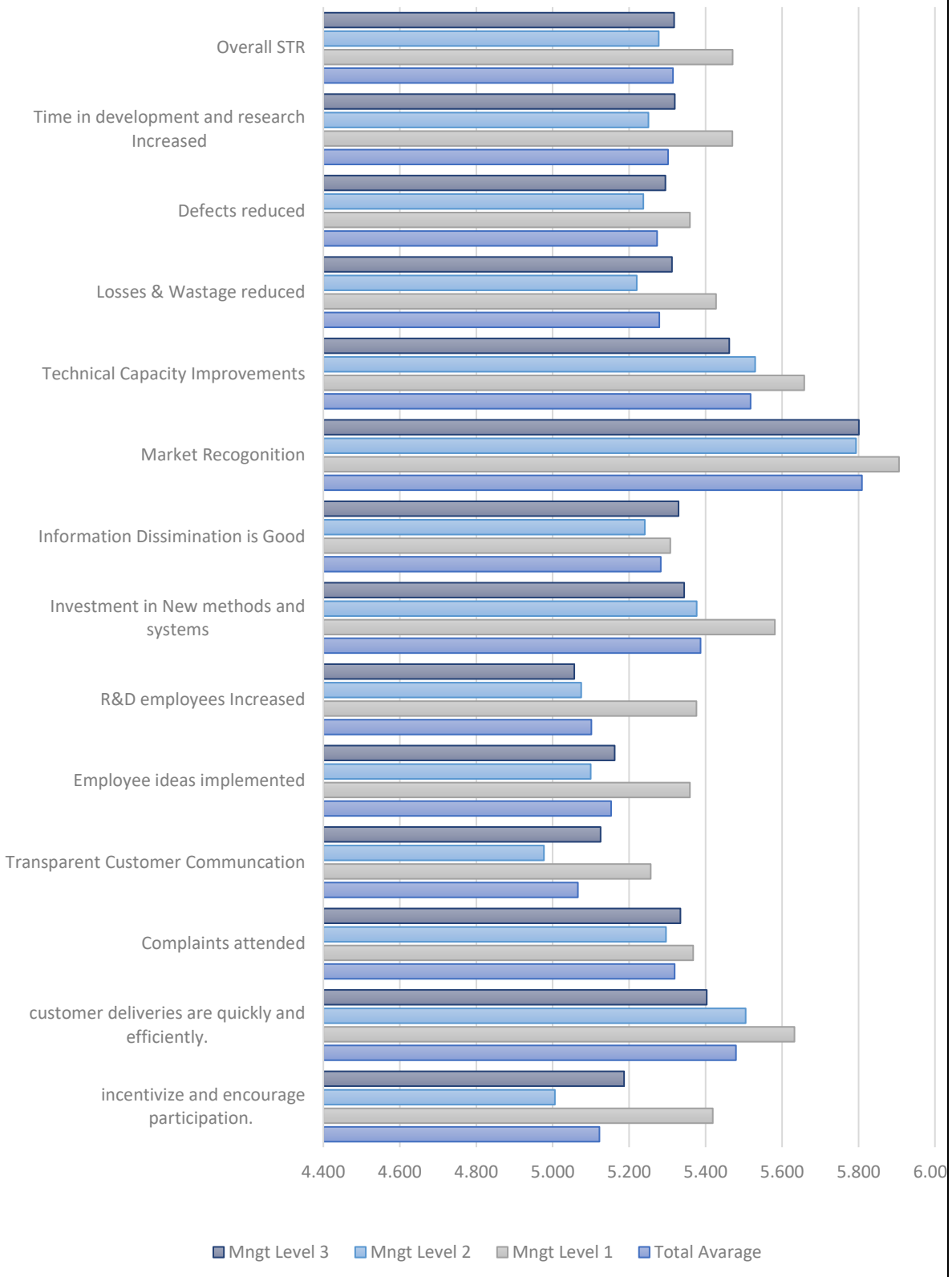
Figure 8:Perception of Human Intellectual Capital by Management Levels

6.3.2 Perception of Structural Capital Indicators

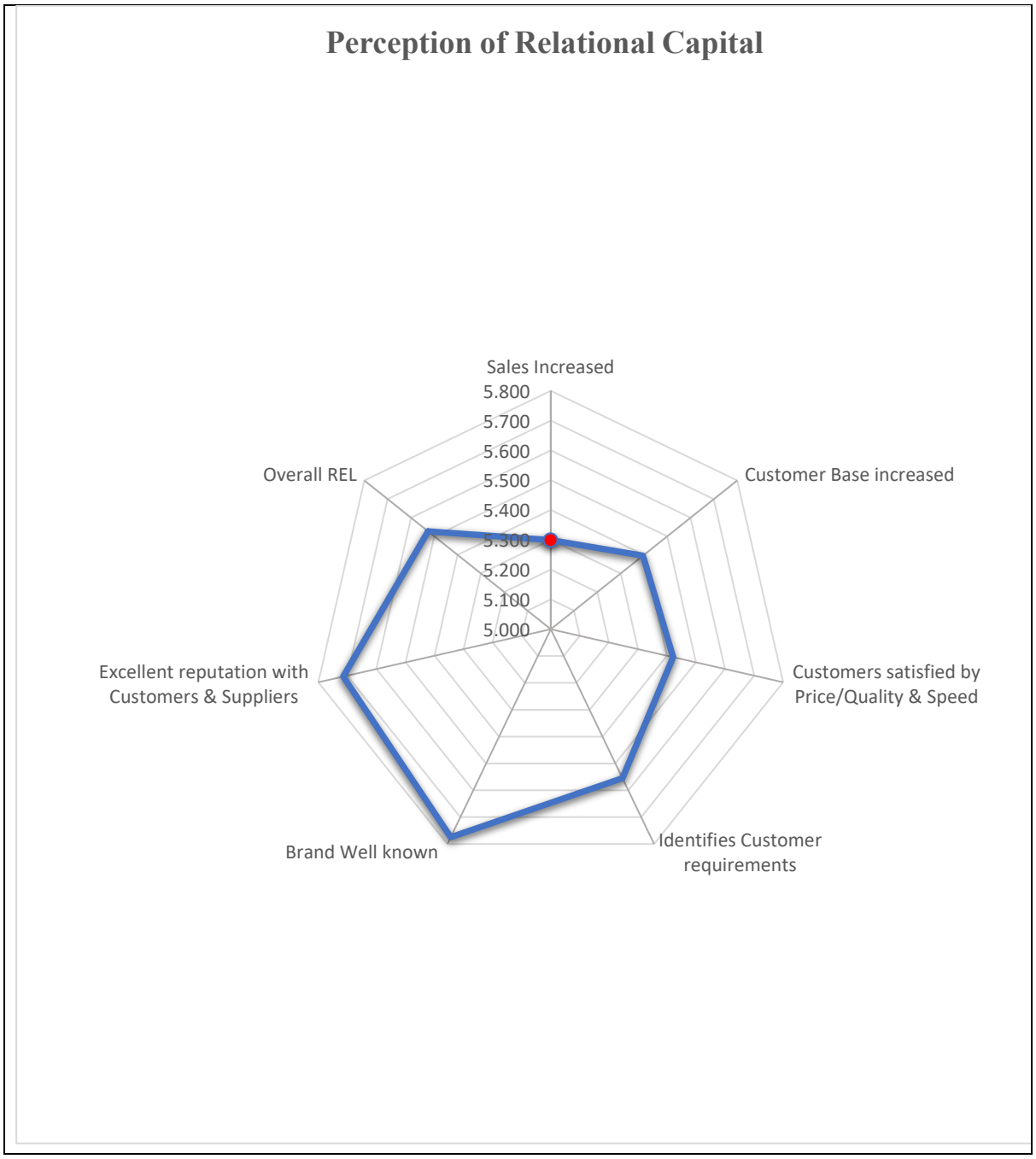


The area of weakness here is Communication and Information dissemination effectively. The observation shows internal as well as external communication issues.

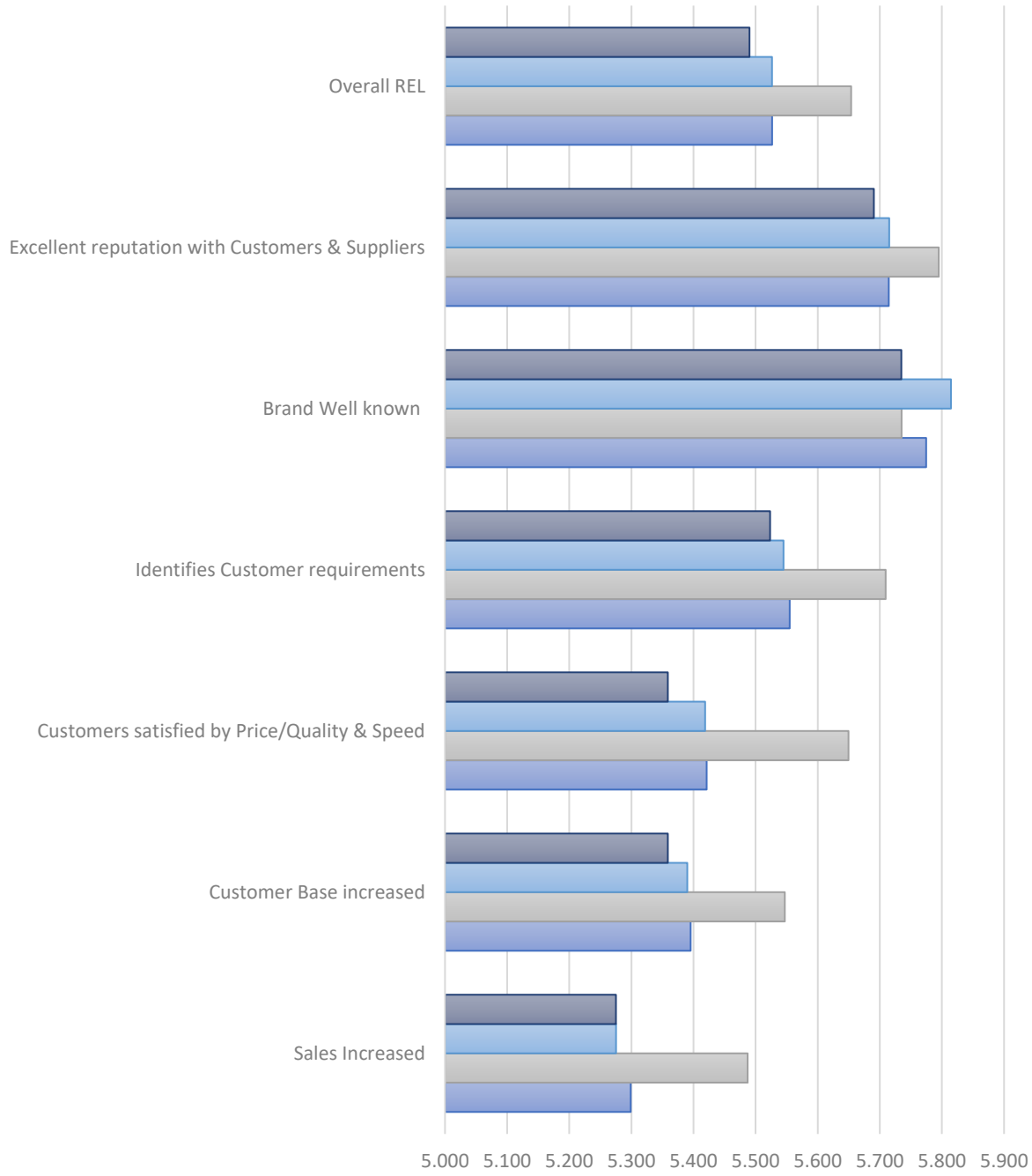
Perception of Structural Capital by Management Levels 1 (Top), 2 (Mid), 3 (front Line managers)



6.3.3 Perception of Relational Capital Indicators

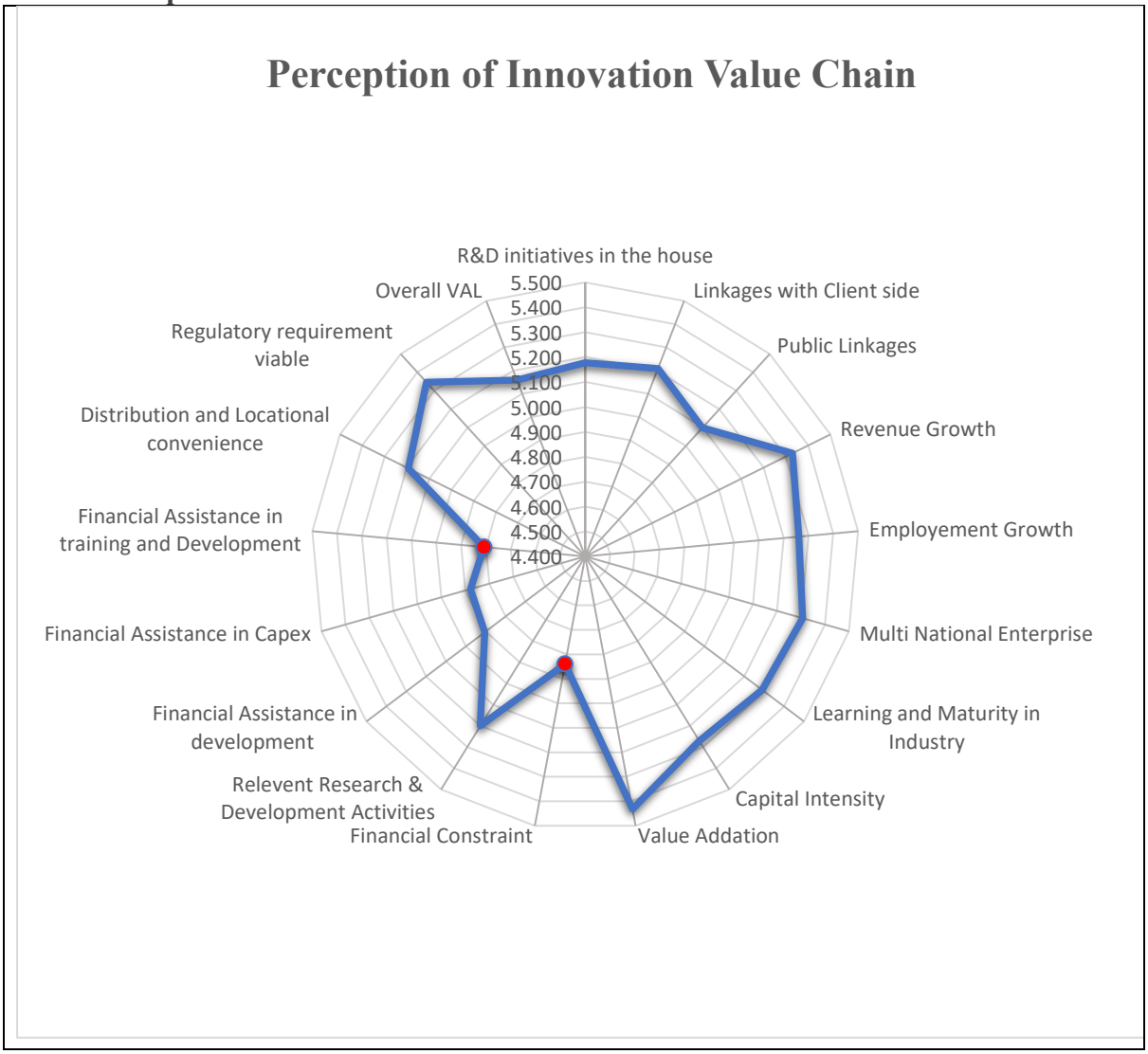


The weakest areas are sales increase and Customer base increasing. This is a challenge during adoption.

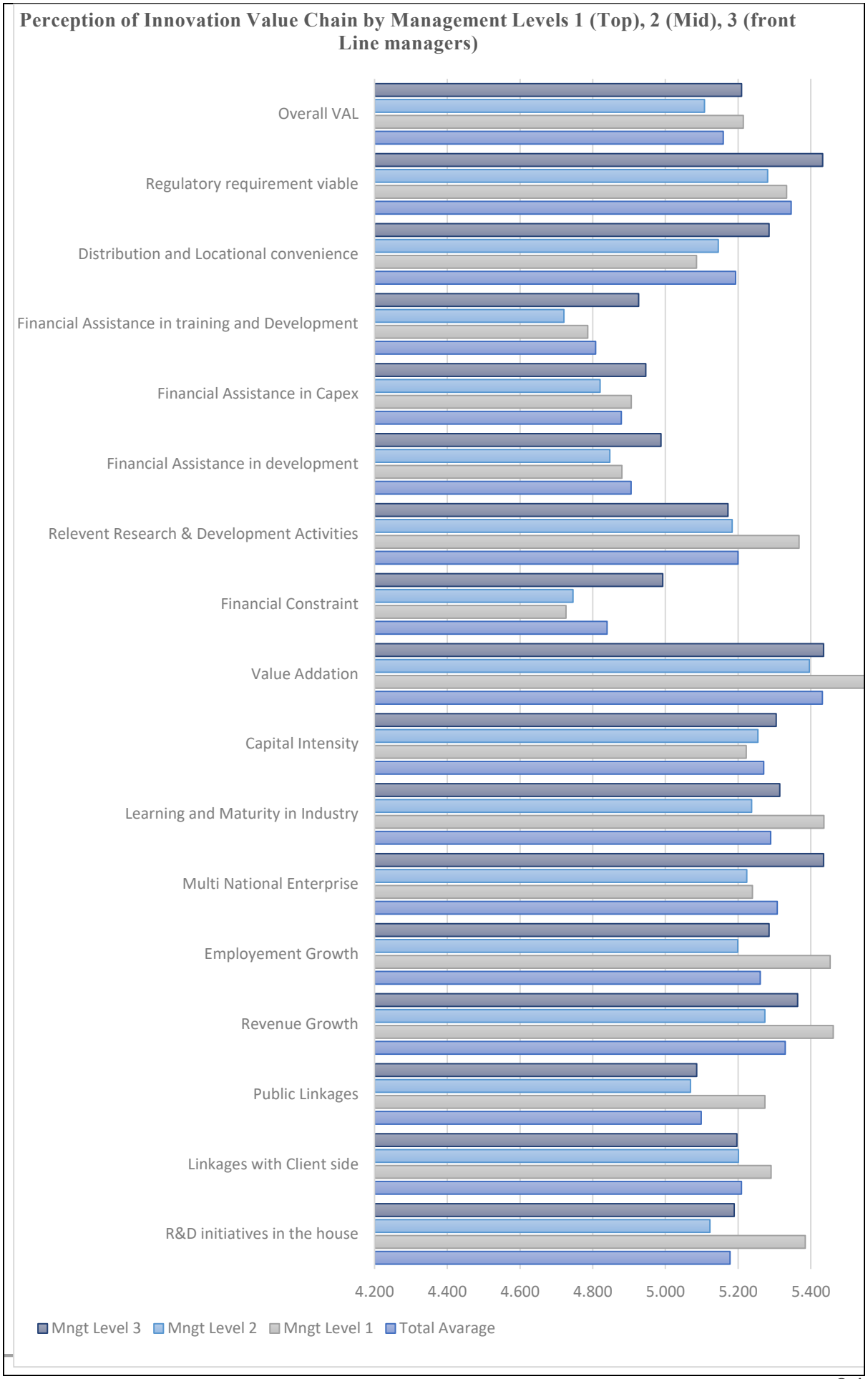

Perception of Relational Capital by Management Levels 1 (Top), 2 (Mid), 3 (front Line managers)
Overall REL
Excellent reputation with Customers & Suppliers
Brand Well known
Identifies Customer requirements
Customers satisfied by Price/Quality & Speed
Customer Base increased
Sales Increased
5.000 5.100 5.200 5.300 5.400 5.500 5.600 5.700 5.800 5.900

	Sales Increased	Customer Base increased	Customers satisfied by Price/Quality & Speed	Identifies Customer requirements	Brand Well known	Excellent reputation with Customers & Suppliers	Overall REL
Mngt Level 3	5.275	5.359	5.359	5.523	5.735	5.690	5.490
Mngt Level 2	5.275	5.390	5.419	5.545	5.815	5.715	5.526
Mngt Level 1	5.487	5.547	5.650	5.709	5.735	5.795	5.654
Total Avarage	5.299	5.395	5.421	5.555	5.775	5.714	5.527

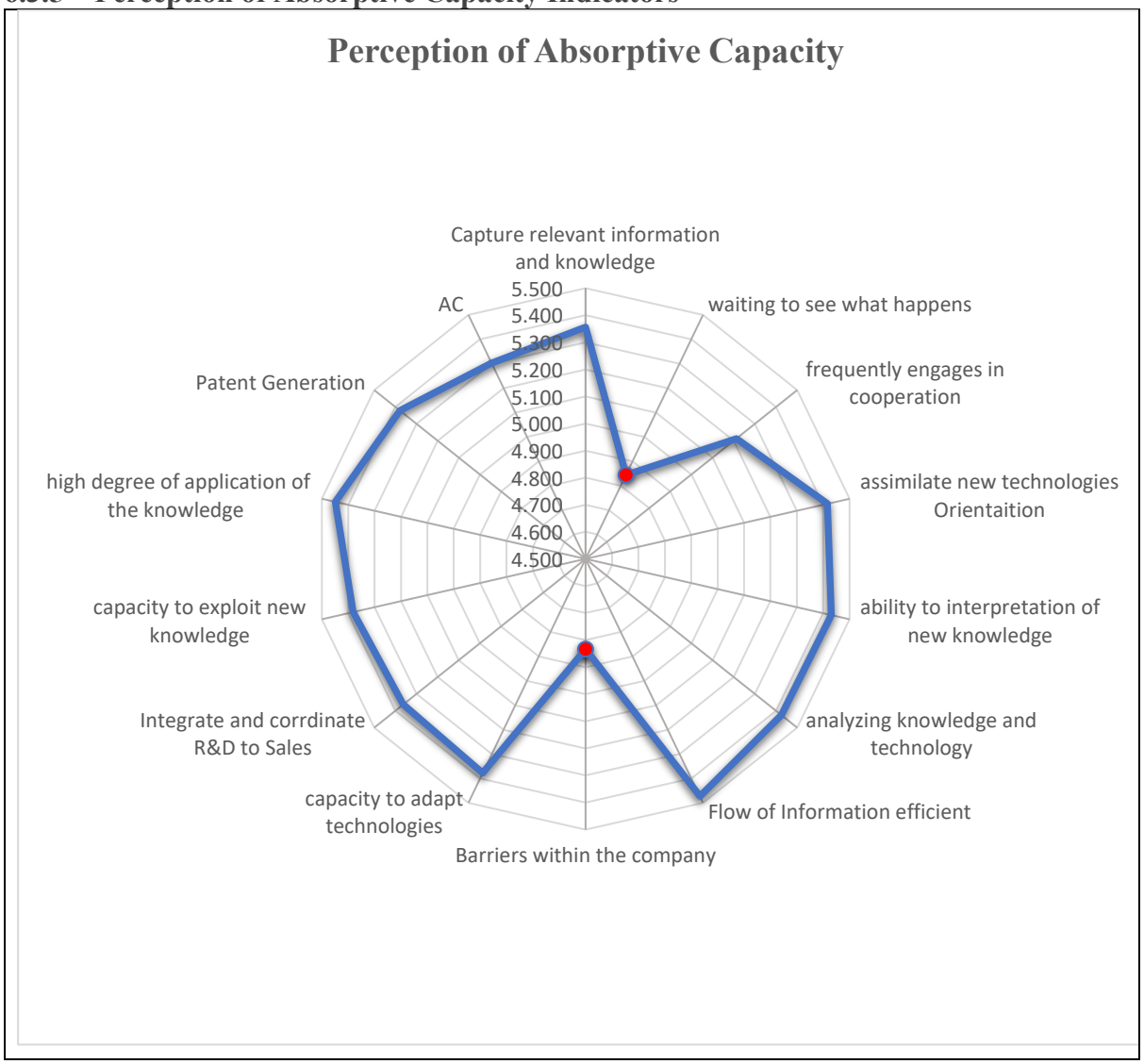
6.3.4 Perception of Innovation Value Chain Indicators



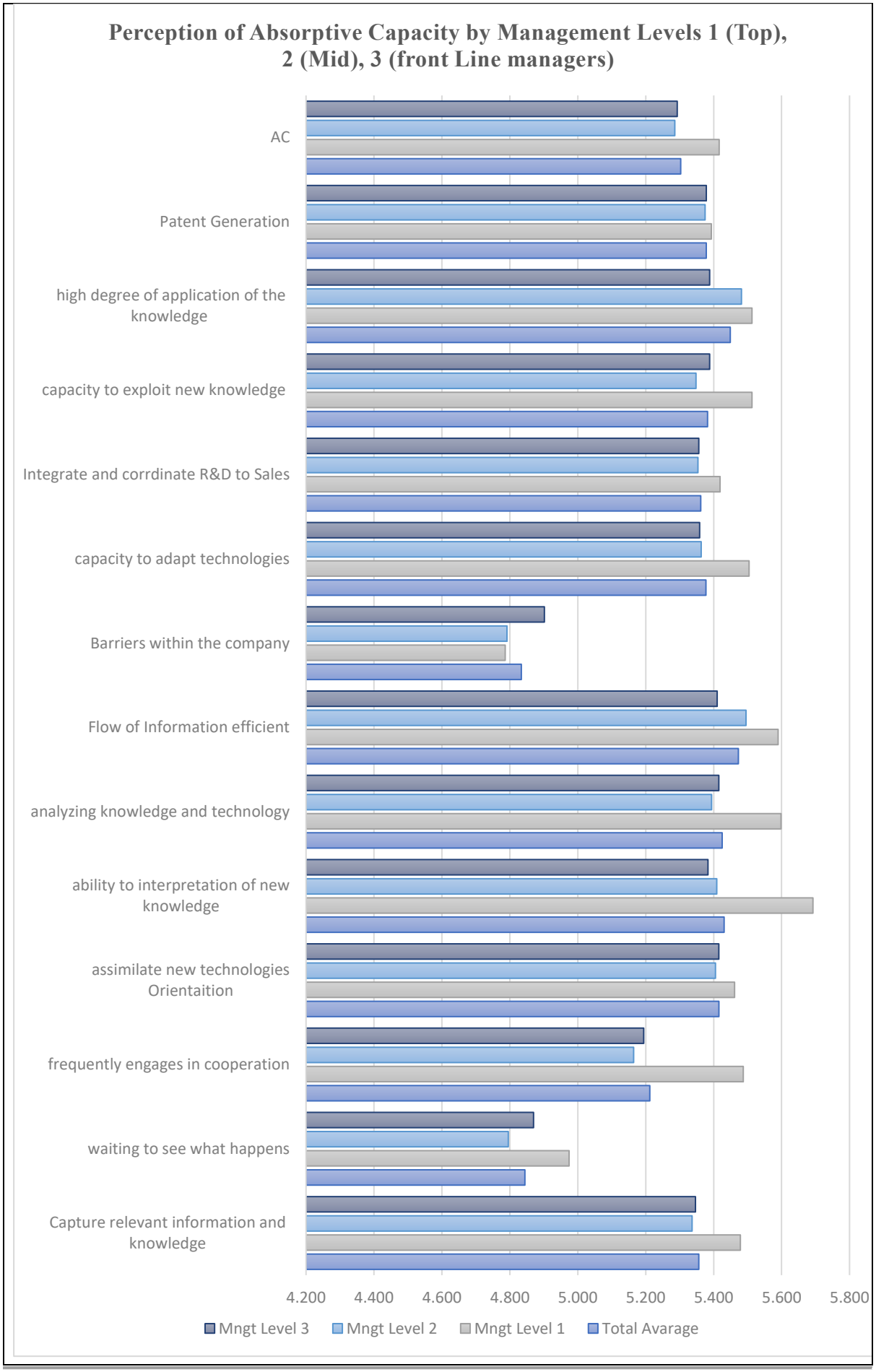
The weakest points here are Financial Assistance for training and development as well as other developmental activities.


Perception of Innovation Value Chain by Management Levels 1 (Top), 2 (Mid), 3 (front Line managers)
Overall VAL
Regulatory requirement viable
Distribution and Locational convenience
Financial Assistance in training and Development
Financial Assistance in Capex
Financial Assistance in development
Relevent Research & Development Activities
Financial Constraint
Value Addation
Capital Intensity
Learning and Maturity in Industry
Multi National Enterprise
Employement Growth
Revenue Growth
Public Linkages
Linkages with Client side
R&D initiatives in the house
4.200
4.400
4.600
4.800
5.000
5.200
5.400
Mngt Level 3
Mngt Level 2
Mngt Level 1
Total Avarage

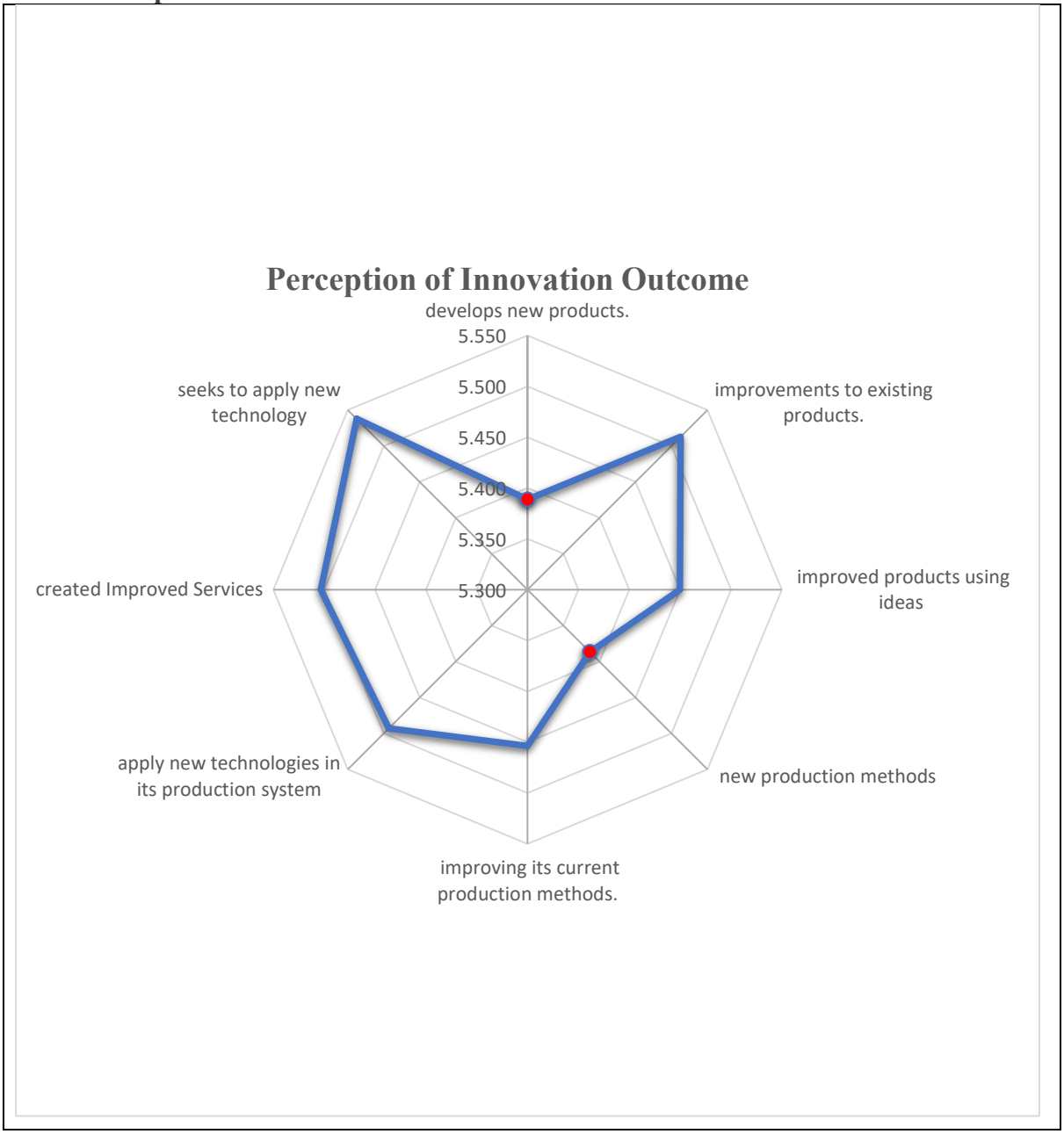
6.3.5 Perception of Absorptive Capacity Indicators



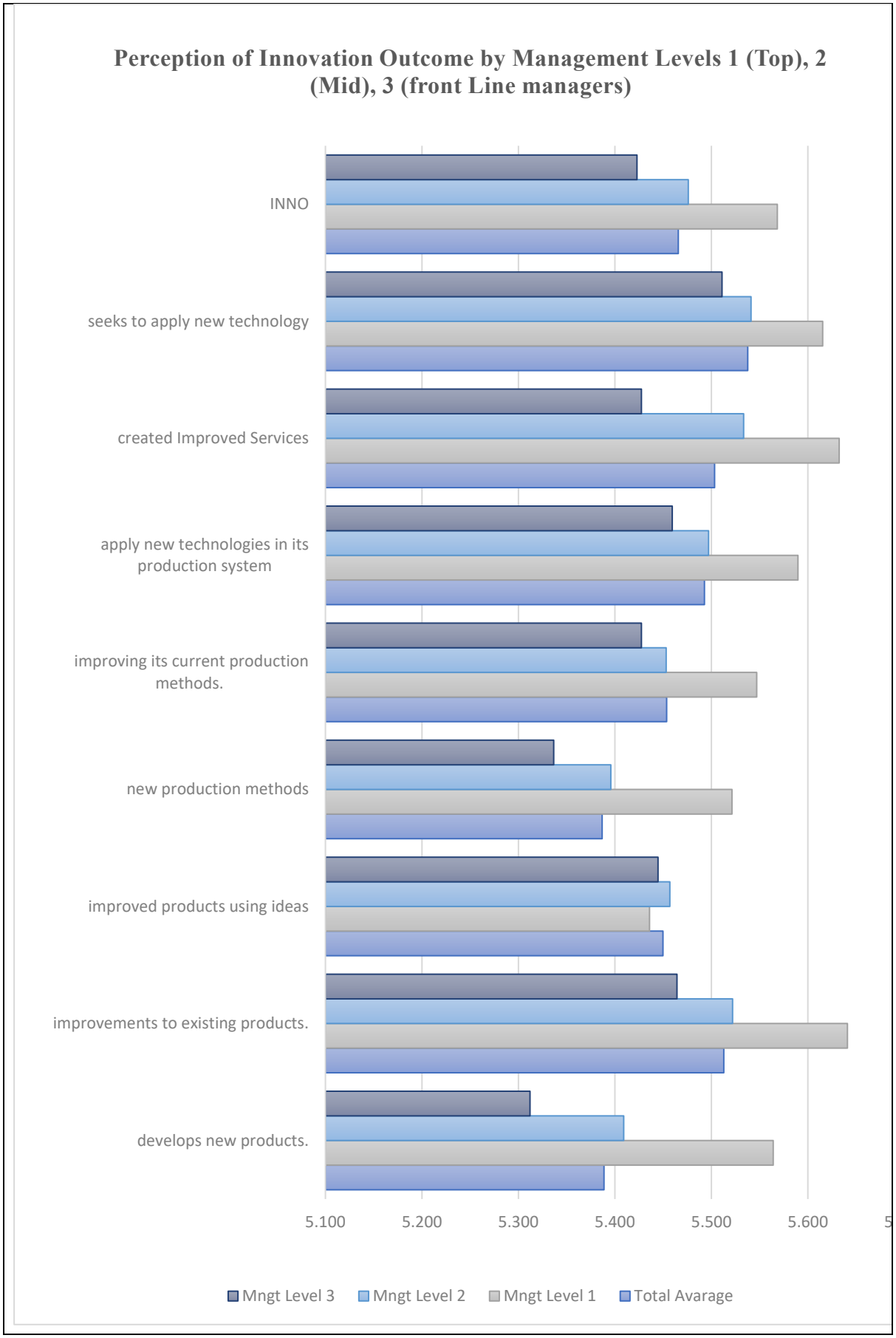
The weakest areas are waiting to see what happens that is a reactive approach to the proceedings of leveraging opportunities. Another weak area is barriers within the company, hurdles that will not allow the innovation process to go smoothly.


Perception of Absorptive Capacity by Management Levels 1 (Top), 2 (Mid), 3 (front Line managers)
AC
Patent Generation
high degree of application of the knowledge
capacity to exploit new knowledge
Integrate and corrdinate R&D to Sales
capacity to adapt technologies
Barriers within the company
Flow of Information efficient
analyzing knowledge and technology
ability to interpretation of new knowledge
assimilate new technologies Orientaition
frequently engages in cooperation
waiting to see what happens
Capture relevant information and knowledge
4.200
4.400
4.600
4.800
5.000
5.200
5.400
5.600
5.800
Mngt Level 3
Mngt Level 2
Mngt Level 1
Total Avarage

6.3.6 Perception of Innovation Outcome Indicators



The area of weakness is the development of New Products and New Services or Product systems.


Perception of Innovation Outcome by Management Levels 1 (Top), 2 (Mid), 3 (front Line managers)
INNO
seeks to apply new technology
created Improved Services
apply new technologies in its production system
improving its current production methods.
new production methods
improved products using ideas
improvements to existing products.
develops new products.
5.100
5.200
5.300
5.400
5.500
5.600
Mngt Level 3
Mngt Level 2
Mngt Level 1
Total Avarage

6.4 Exploratory factor Analysis EFA

As a part of pre-analysis, the exploratory factor analysis was conducted as an initial check with the extraction method as the Maximum Likelihood and Oblimin with Kaiser Normalization Rotation Method using SPSS, version 23. This was to ascertain the grouping of items for the theoretical dimensions. The items with factor loadings of less than 0.3 were suppressed for easy identification of significant items in the component. A factor loading greater than 0.4 is said to be sufficiently loaded on its factor and deemed adequate for inclusion in the model (Hair *et al*., 2014; Shafique *et al.,* 2009). Besides, the Kaiser eigenvalue criterion was employed, as a rule of thumb, an eigenvalue ≥ 1 indicates that a significant amount of variance is explained by the component.

Exploratory Factor Analysis (EFA) is a statistical approach for determining the correlation among the variables in a dataset. This type of analysis provides a factor structure (a grouping of variables based on strong correlations). This will be required for this study to explain the Developed hypotheses which represent your model for Direct Effects, Indirect effect, Mediated Effects in previous chapters.

After ascertaining EFA the study will develop SEM with validating in CFA.

Data has been checked and prepared during descriptive statistics for Case Screening, Missing data in rows, and unengaged response. Outliers will be conducted within the CFA model using the Mahalanobis distance parametric test.

The reasons for using Maximum Likelihood and Dir. Oblimin is (i) Maximum Likely hood is a stricter method based on distances and rotations. (ii) Oblimin was required as orthogonal required completely unrelated subjects, while in perception studies that is not the case, and Promax or Oblimin work better on these objects. (Please find the rationale for using the method in Annexure).

The following are the steps carried out for EFA.

i. Iterate until you arrive at a clean pattern matrix.: The EFA rotated matrix is presented below after the deletion of HC409, STR502, STR503, STR509, VAL710, VAL715, VAL716 due to low loadings and as indicated by reliability analysis. Pattern matrix using Extraction Method of Maximum Likelihood which gives a result for carrying out CFA as it uses the same method. The rotation method used Oblimin with Kaiser Norm. kappa as zero works better as this is a perceptual study (. The rotation

converged in 16 iterations. The cut-off for suppression of coefficient as insignificant is 0.35.

ii. Adequacy (KMO, Communalities) is adequate

iii. Convergent validity (loading amplitude on pattern matrix) and Discriminant validity (No major cross-loadings or correlations) as seen in the pattern matrix. The CFA will validate the same parametrically.

iv. Reliability by Cronbach's alpha (Nunnally, 1978) is within the pattern matrix and values are about 0.9 are shown in the top rows of the pattern matrix.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.979
Bartlett's Test of Sphericity	Approx. Chi-Square	49439.488
	df	1653
	Sig.	.000

The value of 0.979 for KMO is adequacy for samples.

Factor Correlation Matrix

Factor	1	2	3	4	5	6	7
1	1.000	-.417	.500	-.719	.466	-.340	.704
2	-.417	1.000	-.337	.342	-.340	.034	-.521
3	.500	-.337	1.000	-.521	.473	-.367	.527
4	-.719	.342	-.521	1.000	-.524	.438	-.652
5	.466	-.340	.473	-.524	1.000	-.235	.534
6	-.340	.034	-.367	.438	-.235	1.000	-.359
7	.704	-.521	.527	-.652	.534	-.359	1.000

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

Factor Correlation Matrix has all the values 0.72 which is acceptable for the factor correlations.

Pattern Matrix

Cronbach alpha -Factor	Factor						
	0.939 -z1	0.931 -z2	0.892 -z3	0.950-z4	0.922-z5	0.913- z6	0.934- z7
AC809	.779						
AC806	.759						
AC805	.750						
AC811	.747						
AC812	.742						
AC810	.739						
AC807	.735						
AC813	.683						
AC804	.618						
AC803	.500						

AC801	.471						
AC808	.462						
AC802	.339						
VAL713		-.925					
VAL714		-.897					
VAL712		-.812					
HC404			.777				
HC405			.755				
HC402			.735				
HC403			.733				
HC406			.569				
HC401			.559				
HC408			.539				
HC407			.432				
INS905				-.884			
INS904				-.874			
INS906				-.868			
INS902				-.801			
INS907				-.778			
INS901				-.764			
INS908				-.760			
INS903				-.754			
STR506					.648		
STR513					.570		
STR507					.564		
STR505					.543		
STR512					.480		
STR511					.459		
STR508					.432		
STR504					.431		
STR510					.345		
STR501					.335		
REL603						-.538	
REL604						-.520	
REL606						-.512	
REL605						-.485	
REL602						-.480	
REL601						-.432	
VAL703							.720
VAL702							.673
VAL701							.635
VAL706							.630
VAL704							.613
VAL708							.600
VAL707							.589
VAL711							.582
VAL705							.530
VAL709							.515

Extraction Method: Maximum Likelihood. Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 16 iterations.

This is simply for validation for different scales that are combined. It shows the strength of the variables that are grouped as a factor. The Cronbach alpha for each factor is strong and significant (Nunnally, 1978)

6.5 Confirmatory Factor Analysis CFA

The models are check for CFA with first-level factors and they lie in the region of 0.4 to 0.8 for correlation and as for the bond between the factors and the items, they look to be fairly strong too at 0.7 and above. There are HR401 at 0.56 and PER902 at 0.64 as an exception. The

following factors are checked_CMIN, DF, CMIN/DF, GFI, RMSEA, CFI, NFI, TLI, RMR, pClose.

Table 16: Summary of the result of the model fit

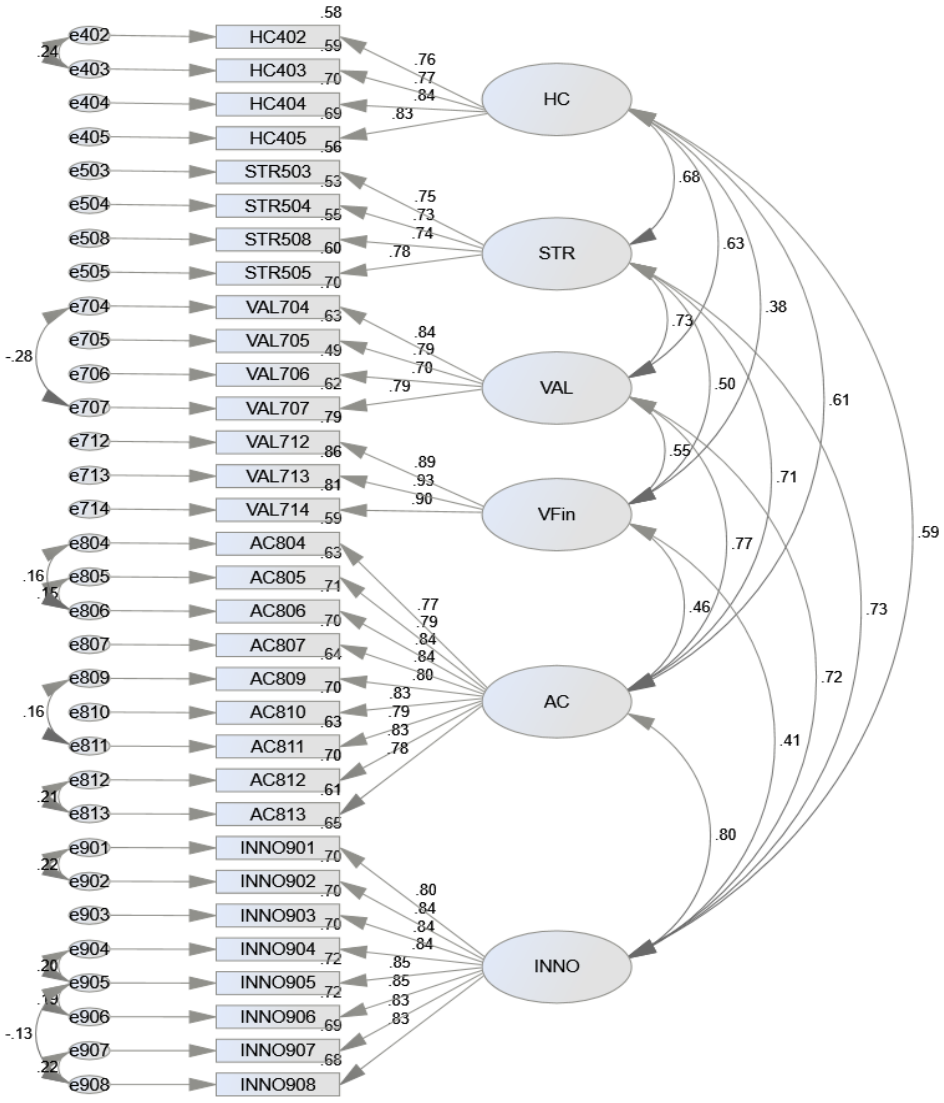
CFA – Model 1- SUMMARY MODEL FIT		
Parameter	Obtained Model Value	Fit Indices Values
CMIN	1760	
CMIN/DF	2.4870	3-5
GFI =	0.8830	>0.95
RMSEA=	**0.036**	**<.08**
CFI=	**.972**	**>.95**
TLI=	0.972	>.95
Standardized RMR =.	0.043	<0.08

All the parameters are within range except GFI which is very closed to 0.09 and is 0.88. and TLI at 0.0490. All other parameters including Standardized RMR are with the conforming range.

Technique Squared Factor Correlations, AVE & Common Method Bias for Discriminant validity or divergent validity, recommended approaches to test for discriminant validity on the construct level are AVE-SE comparisons (Fornell & Larcker, 1981) it would have greater significance if a measurement of inter-construct correlations derived from the CFA model be considered for correlations derived to check for divergence. The raw correlations derived from the data are just indications. AVE must be greater than MSV. Here the Value of CR for all the values >0.5, All AVE are greater than MSV for all parameters. Hence it follows and there are no convergent validity issues or Divergent validity issues. Here the Value of CR for all the values >0.5, All AVE are greater than MSV for the whole parameter. Hence it follows and there are no convergent validity issues or Divergent validity issues.

A total of 33 items were dropped as the factors had almost more than 6 items each. During the SEM the representation has convergent and divergent strength hence these were dropped. Total of 32 items retained from CFA for SEM.

Figure 9: CFA Outcome



Confirmatory Factor Analysis (CFA)
(DataSet Ver 4.4/1045/03012021/Output/InitialCFA4.001)

	CR>0.7	AVE>0.5	MSV	MaxR(H)	VFin	INNO	AC	VAL	STR	HC
VFin	0.9315	0.8193	0.2992	0.9337	**0.9054**					
INNO	0.9483	0.6962	0.6320	0.9486	0.4140	**0.8344**				
AC	0.9449	0.6561	0.6320	0.9461	0.4550	0.7950	**0.8100**			
VAL	0.8622	0.6109	0.5868	0.8696	0.5470	0.7210	0.7660	**0.7816**		
STR	0.8373	0.5628	0.5373	0.8383	0.4990	0.7330	0.7060	0.7320	**0.7502**	
HC	0.7365	0.6405	0.3770	0.7366	0.3760	0.5940	0.6140	0.6300	0.6850	**0.8003**

No Validity Concerns

The checks for Validities are

Convergent Validity: The value of AVE >0.5 for all the latent variables. The calculation of AVE is AVE= Sum (Loading Squares)/ No of Items in the factor. AVE must be greater than

MSV. Here the Value of CR for all the values >0.5, All AVE are greater than MSV for all parameters. Hence it follows and there are no convergent validity issues.

Discriminant Validity: For the factor, the Discriminant value is the Square Root of AVE. This DV must be more than all correlations with another factor. There are no Divergent validity issues.

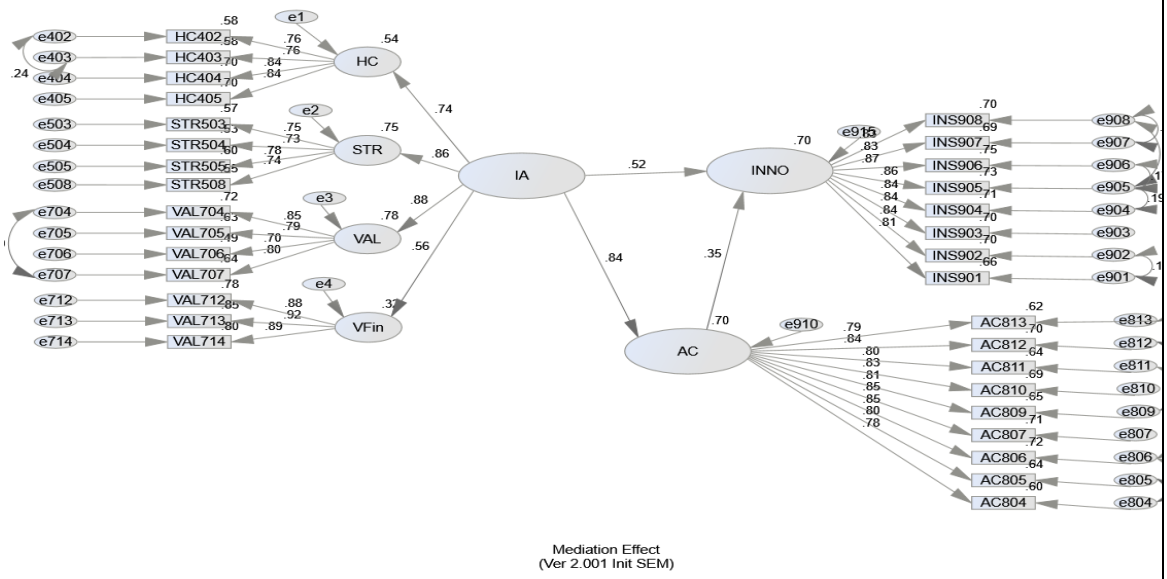


Figure 10: SEM with mediation effect of AC

6.6 Model using Structural Equation Modelling (SEM)

6.6.1 Mediation effect

The result shows that all the relationships to the observed are strong ranging from 0.92 to 0.64, except for HR401 which is below 0.60, which is 0.54. Next, we can observe that the relationship between the Factors is also strong, where the Innovation Activity (IA) has 0.86 with VAL is quite strong, 0.85 with structural Setup of the organization, and then 0.73 with HR shows that it is strong. We see that the financial setup has a warm relationship with activity at 0.56, which shows that the direct bearing is fair. The relationship of IA with the performance indicators is also showing to be very strong at 0.82 without mediation.

This is a partial mediation with a direct defect of 0.52 and mediated effect of 0.83x0.35 gives0.29, thus 0.52+0.29 is 0.81 as the mediated effect

6.6.2 Perceived Influence of enablers

The figure below is the perceived Innovation enablers and their interaction Models for Innovation activity enablers are HR, REL, STR, and IVC on AC and PER

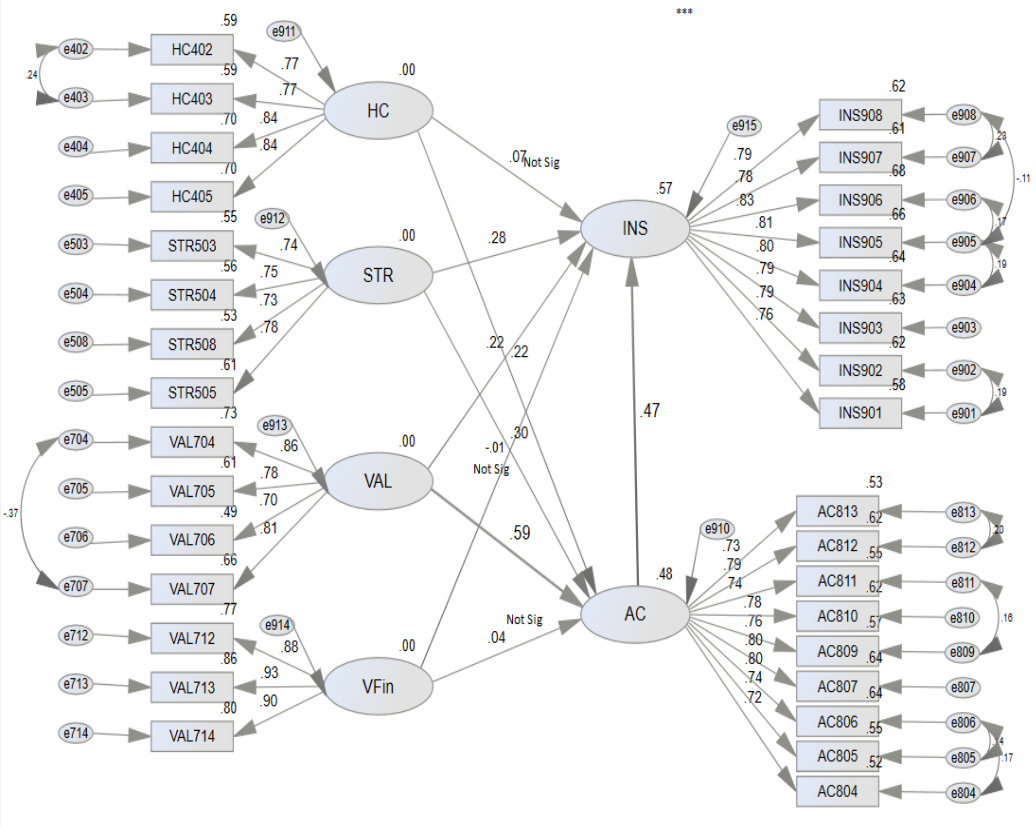


Figure 11:Influence of HC, STR, VAL & VFin on INNO & AC.
All are significant for p<0.001, except mentioned

6.6.3 Findings for Hypothesis

6.6.3.1 Direct Effects

H No	Hypothesis (There is a significant perceived positive relationship between ...)	Supported
H1	**Innovation Activity (IA) and Innovation Indicators (INNO).**	**Supported**
H2	Absorptive Capacity (AC) and Innovation Indicators (INNO)	**Supported**
H3	**Innovation activity (IA) and Absorptive Capacity (AC).**	**Supported**

Regression Weights: (Group number 1 - Default model)	

			Regression Weights:					Standardized Regression Weights	
			Estimate	S.E.	C.R.	P	Label	Estimate	
AC	**<---**	**IA**	**1.104**	**0.063**	**17.609**	*******	**par_30**	**0.839**	**H3**
INNO	**<---**	**IA**	**0.763**	**0.082**	**9.261**	*******	**par_31**	**0.521**	**H1**
INNO	**<---**	**AC**	**0.393**	**0.055**	**7.105**	*******	**par_32**	**0.353**	**H2**
STR	<---	IA	1.106	0.064	17.359	***	par_35	0.865	
VAL	<---	IA	1.270	0.068	18.741	***	par_36	0.884	
VFin	<---	IA	0.990	0.069	14.251	***	par_37	0.563	
HC	<---	IA	1.000					0.736	

6.6.3.2 Mediating Effect

For the H4 Hypothesis, the following are the findings

H No	Hypothesis (There is a significant perceived positive relationship between .)	Supported
H4	**Absorptive Capacity (AC) has a mediating effect between (IA) & (INNO)**	**Supported**

Regression Weights: (Group number 1 - Default model)

			Regression Weights:					Standardized Regression Weights	
			Estimate	S.E.	C.R.	P	Label	Estimate	
AC	**<---**	**IA**	**1.104**	**0.063**	**17.609**	*******	**par_30**	**0.839**	**For H4**
INNO	**<---**	**IA**	**0.763**	**0.082**	**9.261**	*******	**par_31**	**0.521**	**For H4**
INNO	**<---**	**AC**	**0.393**	**0.055**	**7.105**	*******	**par_32**	**0.353**	**For H4**
INNO	**<---**	**IA**	**0.763**	**0.082**	**9.261**	*******	**par_31**	**.83**	**W/o Med**
									For H4

Comparing the mediation effect shows 0.521+ (0.83x0.353) = 0.817. Hence it is partial mediation effect Partial Mediation

Using Sobel test for Mediation, the p value is significant for the mediation effect.

6.6.3.3 Influence of Enablers within the framework

H No	Hypothesis (There is a significant perceived positive relationship between ...)	Supported
H5a	Human Intellectual Capital (HC), and Innovation Indicators (INNO).	(Not Significant)
H5b	Structural Capital (STR), and Innovation Indicators (INNO).	Supported
H5c	Customer Relational Capital (REL), and Innovation s Indicators (INNO).	(Not Significant)
H5d	Innovation Value chain (VAL), and Innovation Indicators (INNO).	Supported

Regression Weights: (Group number 1 - Default model)

			Regression Weights:					Standardized Regression Weights	
			Estimate	S.E.	C.R.	P	Label	Estimate	
INS	**<---**	**HC**	**0.067**	**0.03**	**2.246**	**0.025**	**par_39**	**0.074**	**H5a**
INS	**<---**	**STR**	**0.28**	**0.039**	**7.249**	*******	**par_40**	**0.284**	**H5b**
INS	**<---**	**VAL**	**0.185**	**0.036**	**5.09**	*******	**par_41**	**0.216**	**H5d**
INS	**<---**	**VFin**	**-0.008**	**0.02**	**-0.419**	**0.675**	**par_42**	**-0.012**	**Not Significant**

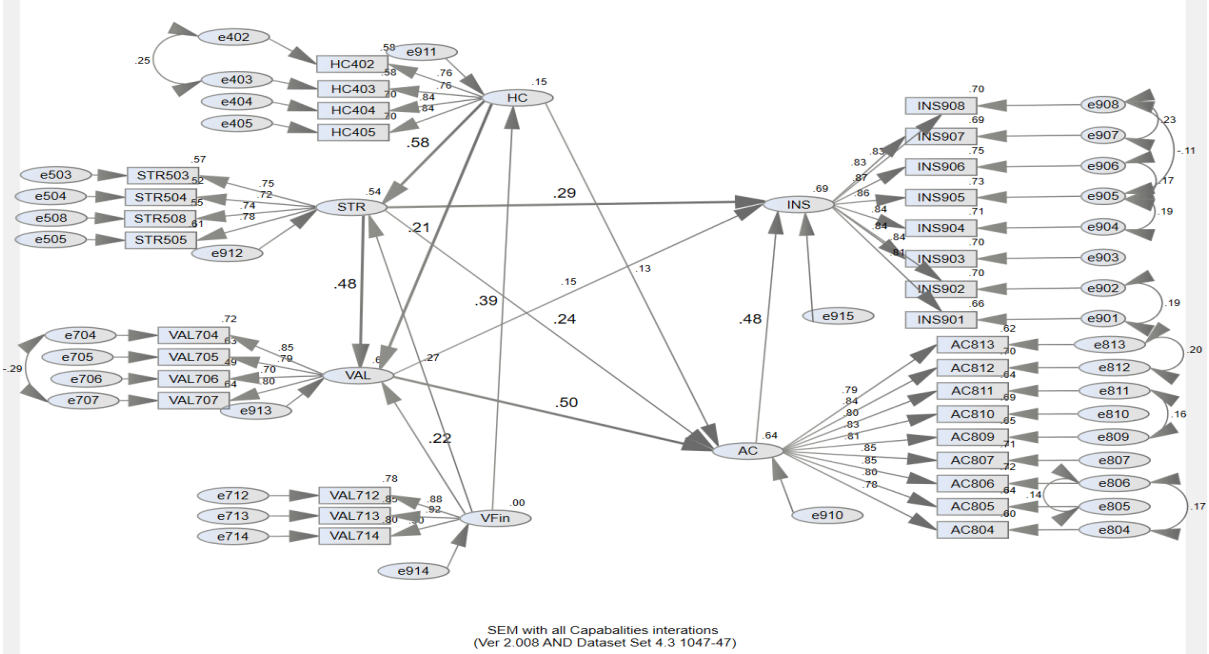
H No	Hypothesis (There is a significant perceived positive relationship between ...)	Supported
H5e	Human Intellectual Capital (HC), and Absorptive Capacity (AC).	**Supported**

H5f	Structural Capital (STR), and Absorptive Capacity (AC).	**Supported**
H5g	Customer Relational Capital (REL), and Absorptive Capacity (AC).	(Not Significant)
H5h	**the Innovation Value chain (VAL) and Absorptive Capacity (AC).**	**Supported**

Regression Weights: (Group number 1 - Default model)

			Regression Weights:					Standardized Regression Weights	
			Estimate	S.E.	C.R.	P	Label	Estimate	
AC	<---	HC	0.176	0.029	6.08	***	par_43	0.217	H5e
AC	<---	STR	0.264	0.036	7.383	***	par_44	0.301	H5f
AC	<---	VAL	0.447	0.033	13.701	***	par_45	0.586	H5h
AC	<---	VFin	0.024	0.019	1.219	0.223	par_46	0.038	Not Significant

6.7 Further Analysis of Linkages



6.7.1 Summary of Findings is as follows

1. For the effects obtained from SEM.
2. Direct Effects for H1, H2, H3 are significant.
3. Mediating effect there is partial mediation found for H4 to be significant
4. Effect/ Influence of enablers on Innovation outcome is all significant with direct and indirect contribution as per the hypothesis. Except for REL which was weak and removed, (Jaider Vega-Jurado, 2008)

5. VAL broke into two parts processes and financial parameters.

6.7.2 A model was tested further for further analysis, shows

6. VFin is a first enabler in the whole model, a strong asset, and required before HR and STR
7. HR is a strong first mover, it does not impact outcome directly but through AC and VAL
8. AC is a partial mediator for factor IA and individual for component VAL and STR while weak for HR and VFin.
9. AC mediates for IA as well as STR and VAL
10. AC is major assistance for Outcome INNO and the next strong factors assisting INNO are VAL and STR
11. VAL and STR are major drivers for AC

7 Discussion:

The innovation measurement is an important aspect in this study and for the organisations which value innovation in their strategic intent well recognized Innovation and its measurement, and is acknowledged in both academia and industry. However, innovation measurement is not a common practice in the industry. Some of the major reasons are the lack of available metrics and data collection mechanisms to measure innovation are due to the intangible nature of innovation and its influencing factors also being intangible. The organizations which do measure innovation use only a few metrics that do not cover the concept very well. This is partly because of the lack of a consistent definition of innovation in the industry.

This conceptual model constructed in this study aids at bridging the gap towards identifying measurable key aspects of innovation to understanding the enabler within innovation framework and performance for service-oriented companies. And the Perception measurements of the factors are for Innovation success performance as an outcome. The outcome is captured with significant relationship and their leveraging is explored for large scale

7.1 Viewed with Objectives

No	Hypothesis There is a significant perceived positive relationship between…	Supported
H1	…Innovation Activity (IA) and Innovation Outcome (INNO).	Supported
H2	…Absorptive Capacity (AC) and Innovation Outcome (INNO)	Supported
H3	…Innovation activity (IA) and Absorptive Capacity (AC).	Supported
H4	… (AC) has a mediating effect between (IA) & (INNO)	Supported
H5a	…Human Intellectual Capital (HC), and Innovation Outcome (INNO).	(Not Significant)
H5b	…Structural Capital (STR), and Innovation Outcome (INNO).	Supported
H5c	…Customer Relational Capital (REL), and Innovation Outcome (INNO).	(Not Significant)
H5d	…Innovation Value chain (VAL), and Innovation Outcome (INNO).	Supported
H5e	…Human Intellectual Capital (HC), and Absorptive Capacity (AC).	Supported
H5f	…Structural Capital (STR), and Absorptive Capacity (AC).	Supported
H5g	… Relational Capital (REL), and Absorptive Capacity (AC).	(Not Significant)
H5h	…The Innovation Value chain (VAL) and Absorptive Capacity (AC).	Supported

1. A study of employees' perception about innovation activity and Innovation Outcome as the Innovation Framework with enablers within the organization
    - Perception has been seen in the variations for each item as significant and insignificant. The strong factors are enablers for the innovation framework assets of Innovation. From the hypothesis, these have been identified. Found out that the direct impact of knowledge integration on innovation performance is significant only in India, also found in studies by Zhang, Qi, Wang, Pawar, and Zhao (2015)
    - This is one of the few studies for measuring Industry awareness about employee perception of Innovation. This includes awareness about enabler indicators & Innovation framework. The measurement technique used was for component level. These at the component level are Innovation capital assets. The measurement model was tested for company assets that are responsible for Innovation capital. The strength and linkages are established by measurement.
2. ***Develop and validate a scale for the measurement of Innovation during the generation of Innovation stage***

- The measurement technique used was for component level. These at the component level are assets.
- The measurement model was tested for company assets that are responsible for Innovation capital. The strength and linkages are established by measurement.

3. *A **study of Innovation framework enablers at component level as enablers of Innovation and Innovation activity, Absorptive Capacity, and Innovation Outcome.***

    - "AC plays a role in mediating new knowledge creation (Van Den Bosch, Volberda, & De Boer, 1999), while others have shown that knowledge acquisition has an indirect influence on innovation "(Darroch & McNaughton, 2003)

    - The strengths within the model, the model fit, and the outcome for Innovation generation are statistically significant and ranges are reasonable to make conclusions for direct, indirect, and mediation.

4. ***A study linkage of components within Innovation Framework for their perceived effect of Innovation activity on Innovation outcome measured, and also the perceived effect of Absorptive Capacity on Innovation outcome measured***

    - The perceived effects and related strengths have been established by the hypothesis with the primary direct effect to be significant and moderate and strong.

    - The sectorial differences have also been checked which is present and the banking sector falls out of the league for innovation activity as well as knowledge management required for innovation.

7.2 Similarities and Departures from existing Studies

7.3 Comparison of Departure in Results from other studies

1) For the study by Subramaniam, M., & Youndt, M. A. (2005) Intellectual capital & capabilities, on Influence of intellectual capital on the types of innovative capabilities. The observed is. (a)Organizational capital positively influenced incremental innovative capability; (b) Human capital interacted with social capital to positively influence radical innovative capability; (c) A surprising discovery that human capital by itself was negatively associated with the radical innovative capability; and (d) Interestingly, social capital played a significant role in both types

of innovation, as it positively influenced incremental and radical innovative capabilities

2) For the study by Hartono, A. (2015) on Capability-based framework, it is found that (a)Integration of new ideas which are relevant to firm's capability and (b) a Wider range of internal and external new idea sources and types of innovation as the output of innovation activities
3) By Fariborz Damanpour (2017) in the context of Organizational Innovation, this study finds that the parameters are for environment and Innovation. Contextually focus is larger constituents & environment for innovation as a framework

Table 17: Departures in results

	"Author(s)	**Emphasis**	**Remarks**
1	Subramaniam, M., & Youndt, M. A. (2005)	Intellectual capital & capabilities	Influence of intellectual capital on the types of innovative capabilities. Organizational capital positively influenced incremental innovative capability; human capital interacted with social capital to positively influence radical innovative capability; a surprising discovery that human capital by itself was negatively associated with the radical innovative capability; and interestingly, social capital played a significant role in both types of innovation, as it positively influenced incremental and radical innovative capabilities
2	Hartono, A. (2015)	capability-based framework	Integration of new ideas that are relevant to the firm's capability A wider range of internal and external new idea sources and types of innovation as the output of innovation activities
3	Fariborz Damanpour (2017)	Organizational Innovation	The parameters are for environment and Innovation. Contextually focus is larger constituents & environment for innovation as a framework"

7.4 Comparison of Similar Results from other studies

1) From the study by Gracioli, C., Godoy, L. P., Lorenzett, D. B., & Godoy, T. P. (2013). Which is based on only three-parameter tested HR, REL, and STR. It is found that the Intellectual Capital: An Innovative Tool in the Search for Competitive Advantage. Review of Administration and Innovation, where the

Method -regression analysis and further found that the Adjusted R square is 0.623. He further states that intellectual capital is a source of competitive advantage

2) From the study by Roper, S., Du, J., & Love, J. H. (2008), where the study is especially done only for the value chain and its modeling the innovation value chain. Research Policy. The strength is different to this study in aspects and research tool development for capturing the value chain, also the method used is regression analysis.
3) From the study by Cassol, A., Gonçalo, C. R., Ruas, R. L., Ruas, C. R. G., Roberto Lima. (2016) are a Case-based study and they have to redefine the relationship between intellectual capital and innovation. Where the study uses the PLS method using PLS. the method is similar but the consideration is for Innovation capital and not activity. Comparatives show that the outcomes weights are lower.

Table 18: Similarity in the Results

	“Author	Reference	Remarks
1	Gracioli, C., Godoy, L. P., Lorenzett, D. B., & Godoy, T. P. (2013).	Intellectual Capital: An Innovative Tool in the Search for Competitive Advantage. Review of Administration and Innovation	Only three-parameter tested HR, REL, and STR. Method -regression analysis. Adj. R square is 0.623. intellectual capital is a source of competitive advantage.
2	Roper, S., Du, J., & Love, J. H. (2008).	Modeling the innovation value chain. Research Policy	Only looked for the value chain. The strength is different from this study.
3	Cassol, A., Gonçalo, C. R., Ruas, R. L., Ruas, C. R. G., Roberto Lima. (2016).	Redefining the relationship between intellectual capital and innovation.	Case-based study. The study uses HR, REL, STR, with AC for Innovation Outcome. Method using PLS. Outcomes weights are lower.”

Further, AC plays a role in mediating new knowledge creation (Van Den Bosch, Volberda, & De Boer, 1999), while others have shown that knowledge acquisition has an indirect influence on innovation (Darroch & McNaughton, 2003). The strengths within the model, the model fit, and the outcome for Innovation generation are statistically significant and ranges are reasonable to make conclusions for direct, indirect, and mediation.

The perceived effects and related strengths have been established by the hypothesis with a primary direct effect to be significant and moderate and strong.

The sectorial differences have also been checked which is present and the banking sector falls out of the league for innovation activity as well as knowledge management required for innovation.

7.5 Key outcome

i. Component Level Study - This study measures the component level of enablers of Innovation within the Innovation framework under the Activity for Innovation performance.
ii. Innovation Framework components for their Linkages and Strength - A new model is developed by combining existing scales.
iii. The model deciphers the linkages and strength of relationships.
iv. Influence of Innovation Framework as Perceived by Employees - A conceptual model is used to study the perception of the employees.

7.6 Key Findings

a) Human Resource Capital
    a. HR is a strong first mover,
    b. Its impact is only through STR, VAL and AC for the Influencing values
b) Structural Capital
    a. STR are major drivers for AC
    b. STR also Impact the INNO Directly
c) Relational Capital
    a. This appears to have a captive Setup of the companies under study and
    b. REL which was weak and removed, (Jaider Vega-Jurado, 2008)
d) Innovation Value Chain
    a. VAL broke into two parts, viz. processes & financial. Financial VAL Critical first mover.
    b. Value chain is a very strong mediator for all enablers considered ; VAL has a direct impact on the outcome
e) Innovation Activity
    a. AI as an enabler has Influence on Innovation outcome. They are significant with direct and indirect contribution as per the hypothesis.

f) Absorptive Capacity
    a. AC mediates for IA to INNO | AC also mediates for STR and VAL to INNO
    b. AC is a complex and Strong construct and it enhances Innovation
g) Innovation Performance
    a. INNO studied for Product and Process Innovation.
    b. INNO is influenced very strongly by AC, STR and VAL. There is no direct influence from HR and VFin.

8 Implications

A Conceptual model for Perceived Innovation Framework elements is created and established for these measures. The mediation role of Absorptive Capacity in terms of linkages is tested and validated. Financial asset as an enabler is identified as an important factor. Perception for each Indicator for Innovation is analyzed.

There appears to be a difference in perception by various levels of management. Top management perceives higher capabilities, commitments, and insight, unlike operational/ junior managers.

To build innovation capability, there has to be adequate administrative and infrastructural setup. To ensure proper absorption of innovation capability, training, and development & freedom for experimentation has to be provided by top management.

A financial eco-system has to be created to support innovation capabilities and to bring innovation to its fruition. Strategies have to be in place for linking short-term innovation to long-term commercial outcomes.

8.1 Theoretical Implication towards academic significance

1) A Conceptual model for Perceived effect of Innovation framework for its capability is created and established for these measures
2) The mediation role of Absorptive Capacity in terms of linkages is tested and validated.
3) Financial capability is identified as an important factor for capability building.

4) Perception for each Indicator of Innovation capability is analyzed.

8.2 Managerial Implications

1) There appears to be a difference in perception by various levels of management. Top management perceives higher order of enablers, capabilities, commitments, and insight, unlike operational/ junior managers.

2) To build enablers of innovation and capability building, there has to be adequate administrative and infrastructural setup.

3) To ensure proper absorption of innovation framework and the set of distinctive capabilities, training, and development & freedom for experimentation have to be provided by top management.

4) A financial eco-system has to create to support the innovation framework of enablers with capabilities and to bring innovation to its fruition.

5) Strategies have to be in place for linking short-term innovation to long-term commercial outcomes.

8.3 Comparative Dash Board

Dashboards as the following can be created

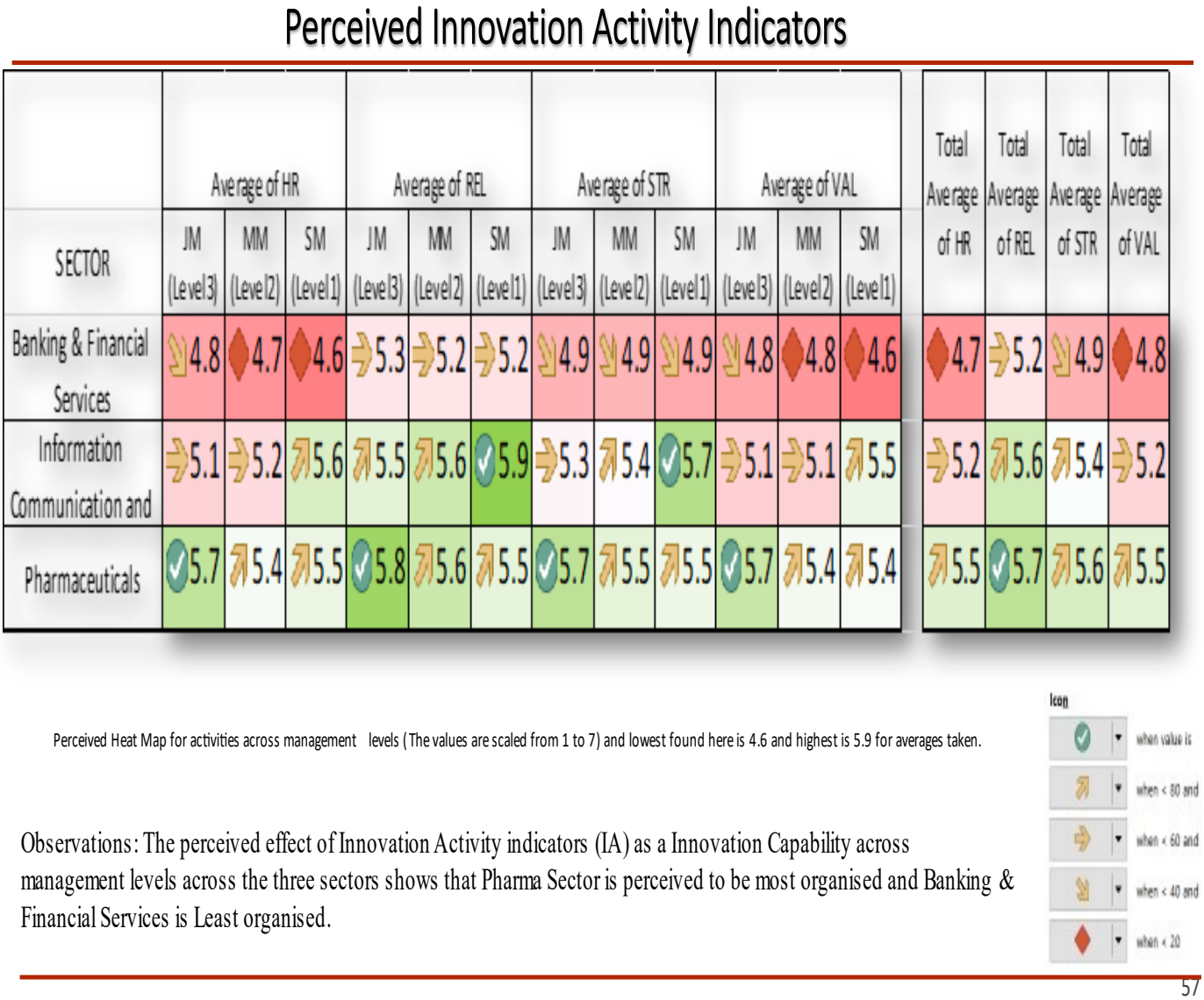

Perceived Innovation Activity Indicators
Average of HR
Average of REL
Average of STR
Average of VAL
Total Average of HR
Total Average of REL
Total Average of STR
Total Average of VAL
SECTOR
JM (Level3)
MM (Level2)
SM (Level1)
Banking & Financial Services
4.8 4.7 4.6 5.3 5.2 5.2 4.9 4.9 4.9 4.8 4.8 4.6 4.7 5.2 4.9 4.8
Information Communication and
5.1 5.2 5.6 5.5 5.6 5.9 5.3 5.4 5.7 5.1 5.1 5.5 5.2 5.6 5.4 5.2
Pharmaceuticals
5.7 5.4 5.5 5.8 5.6 5.5 5.7 5.5 5.5 5.7 5.4 5.4 5.5 5.7 5.6 5.5
Perceived Heat Map for activities across management levels (The values are scaled from 1 to 7) and lowest found here is 4.6 and highest is 5.9 for averages taken.
Observations: The perceived effect of Innovation Activity indicators (IA) as a Innovation Capability across management levels across the three sectors shows that Pharma Sector is perceived to be most organised and Banking & Financial Services is Least organised.
Icon
when value is
when < 80 and
when < 60 and
when < 40 and
when < 20
57

Figure 12: Dashboard - Tracking Innovation Activity

9 Overcoming Challenges - Limitations

1. Measurement of Innovation is challenging as it is dynamic and its indicators are intangible, inseparable from activities, which may be perishable and consumable. These were addressed by taking the insights of employees.

2. Perception studies are subjective. Hence the employees selected from companies with some orientation of Innovation and also given operational definition of Innovation during data Collection

3. Selection of Companies was a challenge due to the lack of explicit indicators/ databases of the practice of innovation. From Prowess the companies with criterion for Innovation selected

4. Data collection was a challenge as companies are not very responsive about their innovation activities. Persistent follow-up and permission were needed to complete this study

10 Future Scope of Research

1) Further research is required for aligning specific organization-level strategic intent with expected Innovation Outcomes.
2) Further research can be conducted to develop a scorecard, using definitive measures emerging from this study, for various innovative activities.
3) Further research is required to **measure actual performance measures** for the capability's portfolio.
4) More research is required to find out how Post academic research (PAR) can be encouraged at the national level.
5) Following expansions can be looked for, with Relevant questions to follow are for the future direction of the study.
    a. Can there be common meta trends under each industry segment linked with the economy?
    b. Can there be parameters linked with the innovation ecosystem?
    c. Can such an ecosystem be identified, measured and built, and replicated?
    d. Can we quantify the terms of an eco system for innovation?
    e. Can innovation output be pleasured by the objective scale and thus ranked for future progress and growth?

11 Recommendations

1) Companies have to create a proper roadmap for the management of Innovation. This should include Training, an Innovation management Portal, Proactive Support system for transformation and exploitation of innovative ideas into commercially successful ventures.
2) Companies should identify milestones in their innovation value chain. This will help them to create an innovation management roadmap. Companies should not put restrictions on timelines or efforts, which could be counterproductive.
3) Companies should convert model parameters into a scorecard for tracking and evaluating the progress of each innovation.
4) Companies ought to create a financial ecosystem to support the entire innovation value chain. This may include funding selected innovations, enabling start-ups, spinoffs, Intrapreneurial ventures, etc.

Keywords used: Innovation perception, Innovative capabilities, Innovation activity, Absorptive capacity, Innovation Performance success, Human Intellectual capital, relational capital, structural capital, innovation value chain, Innovation in Indian Context.

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13 Annexure

13.1 Annexure -Research Tool

FILE NAME -Knowledge Management & Innovation Attitude"

Dear Respondent,

This survey-based questionnaire, is to collect information on practices of your company. This collection on perception mapping for Student research project about your company. This is purely for academic research. and has no commercial purpose or intent. There is no confidential asked.

The survey seeks to understand the perspective you hold about Innovation. In literature Innovation can be defined as "Innovation is the adoption of an idea or behavior, whether a system, policy, program, device, process, product or service, that is new to the adopting organization" or "Innovation is the transformation of knowledge into new products, processes, and services, it involves more than just science and technology. It involves discerning and meeting the needs of the customers." The word Innovation brings in novelty as the emphasis of most innovation definition.

I wish to thank you for your time and efforts for filling up this Survey form.

Researcher
Madhavi Damle

PhD in progress at NMIMS, Mumbai.

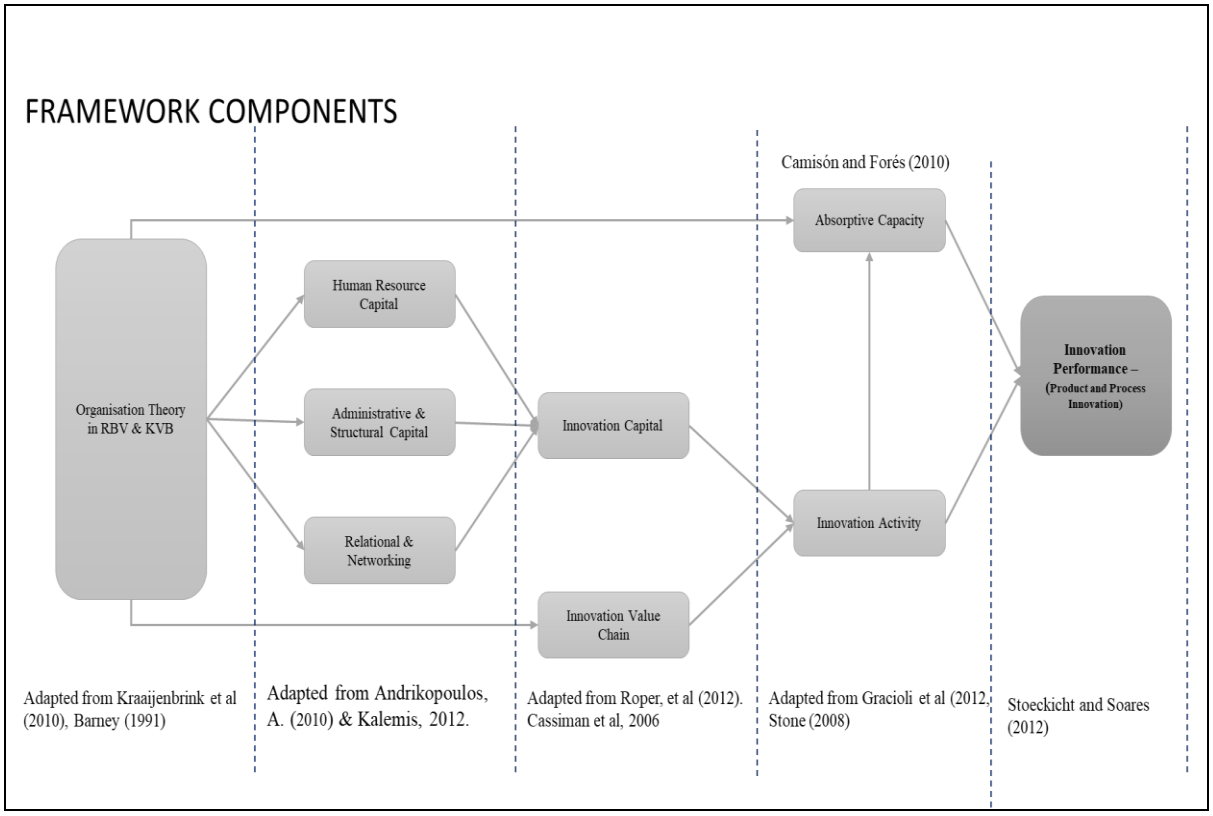
No#	RESEARCH TOOL	
1	Email address * (Mandatory)	
1a	Job Title of the respondent (Mandatory)	
1b	Name (Respondent - optional)	
1c	Contact details (Mobile/ phone/any other- optional)	
2	Name of the Enterprise (Mandatory)	

3	Main activity and Sector							
	4. Please tell us about the progression of HR as a Capital resource in your organisation (Human Capital) with the following. *	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neutral (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
401	The majority of employees have worked for the company for at least 5 years.	1	2	3	4	5	6	7
402	The employees have a good/ sound education/qualification.	1	2	3	4	5	6	7
403	Company trains the employees	1	2	3	4	5	6	7
404	The employees are committed to the company.	1	2	3	4	5	6	7
405	Employees have the competencies needed to innovate in their roles.	1	2	3	4	5	6	7
406	Employees participate in company decisions.	1	2	3	4	5	6	7
407	There is high employee turnover.	1	2	3	4	5	6	7
408	Experimentation is encouraged and employees take initiative	1	2	3	4	5	6	7
409	If a key employee leaves the company there will be losses.	1	2	3	4	5	6	7
	5. Please give your opinion on how does Organisation manages the following within the business. *							
501	The company philosophy is to incentivize and encourage participation.	1	2	3	4	5	6	7
502	Products and services are delivered to customers quickly and efficiently.	1	2	3	4	5	6	7
503	Customers' complaints continue to be reduced.	1	2	3	4	5	6	7
504	Information obtained from customers is always communicated to everyone.	1	2	3	4	5	6	7
505	Employees' suggestions are implemented and creative ideas are shared	1	2	3	4	5	6	7
506	The number of R&D employees has increased.	1	2	3	4	5	6	7
507	There is an investment in new methods and systems from time to time	1	2	3	4	5	6	7
508	Information systems pass on information to everyone in the company.	1	2	3	4	5	6	7
509	The company is recognized in the market for a long time	1	2	3	4	5	6	7
510	There is an improvement in the technical capacity of production processes.	1	2	3	4	5	6	7
511	Losses and wastage have been reduced.	1	2	3	4	5	6	7
512	The rate of defects has been reduced.	1	2	3	4	5	6	7
513	The time spent on research and development has increased.	1	2	3	4	5	6	7
	6. Kindly share your thoughts on how the organization manages its relationships with other entities. *							
601	The Sales /orders have increased.	1	2	3	4	5	6	7
602	The number of new customers has increased.	1	2	3	4	5	6	7
603	Customers are satisfied with the price, quality, and delivery times.	1	2	3	4	5	6	7
604	The company identifies customers' requirements.	1	2	3	4	5	6	7
605	The company's brand is well-known in the market.	1	2	3	4	5	6	7
606	The company has an excellent reputation with customers and suppliers.	1	2	3	4	5	6	7
	7. Kindly share your thoughts on how the organization is dynamic in its value-building activities. *							

701	R&D initiatives being undertaken in the house							
702	Linkages with Client side, Joint ventures and also competition	1	2	3	4	5	6	7
703	Public knowledge linkages to universities, the industry operated labs, or public labs	1	2	3	4	5	6	7
704	Revenue growth on steady rise	1	2	3	4	5	6	7
705	Employment is growing	1	2	3	4	5	6	7
706	Part of a multi-national enterprise	1	2	3	4	5	6	7
707	As a Learning organization -Age is comparable within the industry for Knowledge base	1	2	3	4	5	6	7
708	Capital intensity (investments in fixed assets/total employment)	1	2	3	4	5	6	7
709	Production & Service has value addition	1	2	3	4	5	6	7
710	Innovation constraints especially. shortages of finance	1	2	3	4	5	6	7
711	Relevant R&D being conducted in the group (R&D in group)	1	2	3	4	5	6	7
712	Financial/ Govt assistance on product/process innovation	1	2	3	4	5	6	7
713	Financial/ Govt assistance on capital (plant/machinery)	1	2	3	4	5	6	7
714	Financial/Govt assistance on management training, process development/best practice	1	2	3	4	5	6	7
715	Services Distribution or location - is it convenient	1	2	3	4	5	6	7
716	Legislative/regulatory requirements are at acceptable norms	1	2	3	4	5	6	7
	8. Kindly share your opinion and impressions on the following aspects to understand the capability and capacity of your organisation. *							
801	The company can capture relevant, continuous, up-to-date information and knowledge on current and potential competitors.	1	2	3	4	5	6	7
802	The company management is oriented towards waiting to see what happens, (instead of concern for & orientation towards their environment to monitor trends in a continuous and wide-ranging manner, to discover new opportunities to be exploited proactively.)	1	2	3	4	5	6	7
803	The company gives importance to and frequently engages in cooperation with R&D organizations, universities, business schools, technological institutes, etc., as a member or sponsor to create knowledge and innovations.	1	2	3	4	5	6	7
804	The company can assimilate new technologies and innovations that are useful or have proven potential.	1	2	3	4	5	6	7
805	The company can use employees' knowledge, experience, and competencies in the assimilation and interpretation of new knowledge.	1	2	3	4	5	6	7
806	The company can develop knowledge management programs, guaranteeing the firm's capacity for understanding and carefully analyzing knowledge and technology from other organizations.	1	2	3	4	5	6	7
807	The company has the capacity to use information technology to improve the flow of information, achieve effective sharing of knowledge and foster communication between members of the company, including virtual meetings among employees who are physically distant using: Internet, e-mail, videoconferences, teleconference.	1	2	3	4	5	6	7

808	The company creates barriers that impede all employees from voluntarily passing on useful scientific and technological information they have acquired to others.	1	2	3	4	5	6	7
809	The company has the capacity to adapt technologies created by others to the company's specific requirements.	1	2	3	4	5	6	7
810	The company has the capacity to coordinate and integrate all phases of the R&D process and their interrelations with the functional tasks of engineering, production and sales.	1	2	3	4	5	6	7
811	The company has the capacity to exploit new knowledge at work and rapidly respond to changes in its environment.	1	2	3	4	5	6	7
812	The company achieves a high degree of application of the knowledge and experience acquired in the technological and business fields.	1	2	3	4	5	6	7
813	The company has the capacity to turn technological knowledge into patents for products and processes.	1	2	3	4	5	6	7
	9. Kindly share your insight on the performance of the organisation in the following aspects as given below *							
901	The company develops new products.	1	2	3	4	5	6	7
902	The company develops improvements to existing products.	1	2	3	4	5	6	7
903	The company has created or improved products using employees, customers or suppliers' ideas.	1	2	3	4	5	6	7
904	The company develops new production methods.	1	2	3	4	5	6	7
905	The company is improving its current production methods.	1	2	3	4	5	6	7
906	The company seeks to apply new technologies in its production systems.	1	2	3	4	5	6	7
907	The Company has created Improved Services	1	2	3	4	5	6	7
908	The company seeks to apply new technology for the services to its customers	1	2	3	4	5	6	7
	10. Thank you, in case you wish to add more to this survey (your thoughts).							

The Total Number of Questions are 65 and Demographics 6


FRAMEWORK COMPONENTS
Camisón and Forés (2010)
Absorptive Capacity
Human Resource Capital
Organisation Theory in RBV & KVB
Administrative & Structural Capital
Innovation Capital
Innovation Performance – (Product and Process Innovation)
Relational & Networking
Innovation Activity
Innovation Value Chain
Adapted from Kraaijenbrink et al (2010), Barney (1991)
Adapted from Andrikopoulos, A. (2010) & Kalemis, 2012.
Adapted from Roper, et al (2012). Cassiman et al, 2006
Adapted from Gracioli et al (2012, Stone (2008)
Stoeckicht and Soares (2012)

13.2 Annexure: Descriptive statistics

1) No missing Data. For the data checks, there are no missing values remain. Analyzed in Descriptive statistics and checked for ensuring that in the selected samples there is no missing data. Total responses are in the table below
2) Non-Engaged responses- These were removed. We had ample samples after removal. from 1187
3) Outliers -All observed variables are on the Likert scale, so not outliers as such. There are no continuous variables to check for Outliers. Other control variables like the sector are nominal.
4) Data Collection: This ensures the following entries are done by respondents are unique to one per email address. The response also captures the email address, company name, and designation of each response. The responses need to complete each item in the questionnaire so the missing data is nil
5) Homoscedasticity-Due to the usage of the Likert scale, we have the distribution to have a uniform distribution.
6) Multicollinearity-All the IVF values are between 1 to 2.5, and so all are less than 10 for indicators, seen under later sections. (Refer Appendix for Table)
7) The error can be further reduced if the sample size is much larger for EFA to work better. Larger sample size will diminish the error in your data and so EFA generally works better with larger. The sample size is that of 1045 responses and it large for EFA, CFA, and SEM. Additionally, It is also to be noted that if the dataset has several high factor loadings with a score of greater than 0.7 then even a smaller sample size of say half the respondents or cases will be sufficient **(Guadagnoli and Velicer 1988).**
8) **Hair et al. (2010, 7th ed**., in the SEM chapter on Pg.637), have suggested the following minimum sample sizes based on model complexity and basic measurement model complexities: i. Minimum sample size - 100 is required when the Model contains five or fewer constructs, each with more than three items (observed variables) and with high item communalities (0.6 or higher) ii. Minimum sample size - 150 is required when the Model contains seven constructs or less, modest communalities (0.5), and no under-identified (fewer than three measured items) constructs. iii. Minimum sample size -

300 is required when the Model contains seven or fewer constructs, lower communalities (below 0.45), and/or multiple under-identified constructs. iv. Minimum sample size - 300 is required when the Model contains a large number of constructs (greater than 7), some with lower communalities (below 0.45), and/or having under-identified constructs. This study has 7 constructs with communalities above 0.522 and less than .868. With the number of factors 7 and items as 32., so a sample size of about 300 must be suitable with an anticipated sample size of 500 and collected 1045 responses.

Sample Characteristics

1) Skewness and kurtosis z- value: These should be in the interval of - 1.96 to 1.96
2) Shapiro-Wilk test for its p-Value: This should be above 0.05
3) Histograms and Q-Q plots and Box plots: These should visually indicate that our data is normally distributed
4) Normality- Histograms obtained for all the variables. And the data is normal data collected by Likert scale. And Linearity- sufficiently present.
5) The value of Skewness ranges from -.520 to -1.255 for Std. error of Skewness is 0.072 for all items. And Kurtosis ranges from -.625 to 1.678 with a uniform standard error of 0.142 on all variables. While this might not conform to strict rules of normality, but lies in relaxed rules (3.3 as upper threshold) as suggested by Sposito (1983) as the upper threshold for normality. The thresholds were taken from Kline, R. B. (2011). Principles and practice of structural equation modeling (3rd ed.). New York, NY: Guilford publications and **Sposito, V. A., Hand, M. L., & Skarpness, B. (1983**). On the efficiency of using the sample kurtosis in selecting optimal lpestimators. Communications in Statistics-simulation and Computation, 12(3), 265-272.)

13.3 Reliability -Cronbach Alpha

Reliability Test (I) Cronbach's Alpha Test (II) Split Test

Cronbach's Alpha test for internal consistency for the reliability of data set. Cronbach's alpha is a value of 0.98 (Nunnally, 1978), which is acceptable. And Skewness and Kurtosis are below 3.

Reliability Statistics	
Cronbach's Alpha	N of Items
.980	65

13.4 Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
HC401	1045	5.04	1.568	2.458	-.791	.076	-.015	.151
HC402	1045	5.56	1.352	1.829	-1.421	.076	2.172	.151
HC403	1045	5.55	1.390	1.931	-1.353	.076	1.820	.151
HC404	1045	5.38	1.349	1.819	-1.083	.076	1.221	.151
HC405	1045	5.36	1.365	1.862	-1.107	.076	1.165	.151
HC406	1045	4.94	1.540	2.372	-.794	.076	.003	.151
HC407	1045	4.83	1.512	2.287	-.584	.076	-.272	.151
HC408	1045	5.06	1.517	2.302	-.793	.076	.096	.151
HC409	1045	4.82	1.623	2.635	-.585	.076	-.430	.151
STR501	1045	5.12	1.444	2.085	-.915	.076	.465	.151
STR502	1045	5.48	1.308	1.712	-1.132	.076	1.257	.151
STR503	1045	5.32	1.298	1.685	-.884	.076	.709	.151
STR504	1045	5.06	1.441	2.077	-.803	.076	.231	.151
STR505	1045	5.15	1.402	1.966	-.871	.076	.516	.151
STR506	1045	5.10	1.421	2.019	-.788	.076	.353	.151
STR507	1045	5.39	1.319	1.740	-1.020	.076	.995	.151
STR508	1045	5.28	1.363	1.857	-.926	.076	.720	.151
STR509	1045	5.81	1.258	1.583	-1.224	.076	1.512	.151
STR510	1045	5.52	1.251	1.564	-1.121	.076	1.511	.151
STR511	1045	5.28	1.251	1.566	-.779	.076	.489	.151
STR512	1045	5.27	1.271	1.616	-.964	.076	1.079	.151
STR513	1045	5.30	1.378	1.899	-.901	.076	.603	.151
REL601	1045	5.30	1.303	1.698	-.982	.076	.933	.151
REL602	1045	5.40	1.247	1.556	-.992	.076	1.139	.151
REL603	1045	5.42	1.269	1.610	-.960	.076	.914	.151
REL604	1045	5.56	1.290	1.665	-1.166	.076	1.511	.151
REL605	1045	5.78	1.264	1.597	-1.233	.076	1.570	.151
REL606	1045	5.71	1.234	1.524	-1.190	.076	1.554	.151
VAL701	1045	5.18	1.430	2.045	-.949	.076	.664	.151
VAL702	1045	5.21	1.319	1.739	-.969	.076	.912	.151
VAL703	1045	5.10	1.359	1.847	-.860	.076	.520	.151
VAL704	1045	5.33	1.299	1.688	-.944	.076	.896	.151
VAL705	1045	5.26	1.341	1.798	-.930	.076	.678	.151
VAL706	1045	5.31	1.473	2.170	-.986	.076	.548	.151
VAL707	1045	5.29	1.305	1.704	-1.006	.076	1.157	.151
VAL708	1045	5.27	1.241	1.541	-.738	.076	.473	.151
VAL709	1045	5.43	1.242	1.542	-1.017	.076	1.303	.151
VAL710	1045	4.84	1.535	2.357	-.669	.076	-.187	.151
VAL711	1045	5.20	1.347	1.815	-.863	.076	.651	.151
VAL712	1045	4.91	1.526	2.328	-.817	.076	.246	.151
VAL713	1045	4.88	1.545	2.388	-.809	.076	.225	.151
VAL714	1045	4.81	1.546	2.389	-.708	.076	-.007	.151
VAL715	1045	5.19	1.327	1.760	-.885	.076	.708	.151
VAL716	1045	5.34	1.283	1.646	-.775	.076	.496	.151
AC801	1045	5.36	1.392	1.937	-1.144	.076	1.241	.151
AC802	1045	4.84	1.586	2.515	-.644	.076	-.388	.151
AC803	1045	5.21	1.366	1.865	-.880	.076	.509	.151
AC804	1045	5.42	1.294	1.674	-.954	.076	.787	.151
AC805	1045	5.43	1.294	1.674	-1.113	.076	1.372	.151
AC806	1045	5.42	1.296	1.679	-1.096	.076	1.528	.151
AC807	1045	5.47	1.292	1.669	-1.063	.076	1.270	.151
AC808	1045	4.83	1.650	2.723	-.678	.076	-.340	.151
AC809	1045	5.38	1.289	1.662	-.994	.076	1.099	.151
AC810	1045	5.36	1.262	1.592	-.896	.076	.769	.151
AC811	1045	5.38	1.282	1.643	-.996	.076	.985	.151
AC812	1045	5.45	1.254	1.573	-.964	.076	.985	.151
AC813	1045	5.38	1.338	1.791	-.953	.076	.761	.151
INNO901	1045	5.39	1.379	1.902	-1.022	.076	.912	.151
INNO902	1045	5.51	1.267	1.604	-1.140	.076	1.657	.151
INNO903	1045	5.45	1.273	1.619	-1.008	.076	1.168	.151
INNO904	1045	5.38	1.301	1.693	-1.017	.076	1.146	.151
INNO905	1045	5.45	1.324	1.752	-1.058	.076	1.248	.151
INNO906	1045	5.49	1.262	1.593	-1.112	.076	1.475	.151
INNO907	1045	5.50	1.251	1.564	-1.060	.076	1.326	.151
Valid N (listwise)	1045							

Figure 13: Descriptive Statistics

13.5 Correlation table

Table 19 :Item Correlations table for 70 items grouped

		HR401	HR402	HR403	HR404	HR405	HR406	HR407	HR408	HR409	STR501	STR502	STR503	STR504	STR505	STR506	STR507	STR508	STR509	STR510	STR511	STR512	STR513	REL601	REL602	REL603	REL604	REL605	REL606	VAL701	VAL702	VAL703	VAL704	VAL705	VAL706	VAL707	VAL708	VAL709	VAL710	VAL711	VAL712	VAL713	VAL714	VAL715	VAL716	AC_AB801	AC_AB802	AC_AB803	AC_AB804	AC_AB805	AC_AB806	AC_AB807	AC_TR808	AC_TR809	AC_TR810	AC_EXP811	AC_EXP812	AC_EXP813	PER901	PER902	PER903	PER904	PER905	PER906	PER907	PER908	PER909	PER910	PER911	PER912	PER913
Correlation	HR401	1.0	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.3

13.6 Annexure: Sector Selection

The sector Selection: From the growth industry, the following sectors were selected Industries several major reports were refer together with WIPO and CTIER reports.

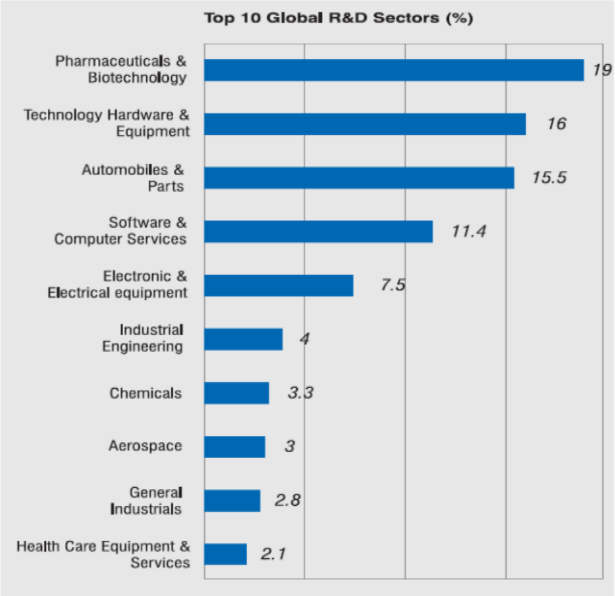
1 Information and communications technology Companies
2 Banking and Financial Services Companies.
3 Pharmaceuticals and Healthcare Companies

SOURCE	1	2	3	4	5	6	7	8	Count
IT and ITES	YES			YES					2
Banking	YES								1
Financial Services	YES				YES	YES			3
Manufacturing – Electronics and or	YES			YES					2
Manufacturing -Chemicals	YES								1
ICT		YES							1
Wireless technology/ Telecom/Digital connectivity/ Telecom Service Providers	YES	YES			YES	YES			4
Pharma		YES		YES					2
Health care/Life sciences and health		YES	YES			YES			3
Horticulture and propagation materials			YES						1
Agri-food			YES	YES				YES	3
Water			YES						1
Chemicals			YES						1
High tech			YES						1
Energy/ Power			YES		YES	YES			3
Logistics/Physical connectivity			YES			YES			2
Creative industries.			YES						1
Auto <1%				YES					1
Biotech 6.2%				YES					1

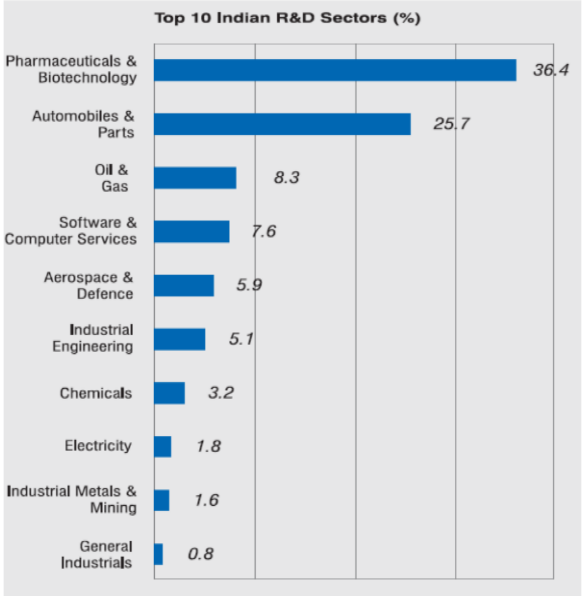
Justification and literature support for zeroing down on these three sectors from both the figures.

Table 20: Sector selection

3.4.1 | Comparison of the Structure of Global and Indian Industrial R&D (Sector Share of Total Industrial R&D Spending)



Source: EU Industrial R&D Investment Scoreboard (2016); Centre for Technology, Innovation and Economic Research (CTIER)



Source: Prowess, data downloaded on 7 February 2018 from the platform; Annual Reports (2015-16) of Indian Companies; Centre for Technology, Innovation and Economic Research (CTIER)

13.7 Annexure: Companies

Banking and Financial Services Companies (FS)	**Information and communications technology Companies (ICT)**	**Pharmaceuticals and Healthcare Companies (PHARMA)**
Axis Bank Ltd.	Bharat Electronics Ltd.	Abbott India Ltd.
Bank of Baroda	Birla Soft Ltd.	Alkem Laboratories Ltd.
Bank of India	Cyient Ltd.	Cipla Ltd.
Central Bank of India	H C L Technologies Ltd.	Dr. Reddy'S Laboratories Ltd.
Corporation Bank	Infosys Ltd.	Emami Ltd.
Dena Bank	KPIT Technologies Ltd	Glenmark Pharmaceuticals Ltd.
HDFC Bank Ltd.	Larsen & Toubro Infotech Ltd.	Lupin Ltd.
ICICI Bank Ltd.	Oracle Financial Services Software Ltd.	Mankind Pharma
Indian Bank	Persistent Systems Ltd.	Natco Pharma Ltd.
Indian Overseas Bank	Subex Ltd.	Novartis India Ltd.
Motilal Oswal Fin. Services Ltd.	Tata Communications Ltd.	Pfizer Ltd.
Oriental Bank of Commerce	Tata Consultancy Services Ltd.	Sun Pharmaceutical Inds. Ltd.
Punjab National Bank	Tech Mahindra Ltd.	Torrent Pharmaceuticals Ltd.
State Bank of India	Tejas Networks Ltd.	Wockhardt Ltd.
UCO Bank	Wipro Ltd.	
Yes, Bank Ltd.		

Industries (The selection methods and the rationale are given in the research design)

1 Information Communication and Telecom
2 Financial Services and Banks.
3 Healthcare and Pharmaceuticals

13.8 Annexure: Removal of Outliers by Mahalanobis

From the data set of 1045 responses data set was set up for CFA. On checks with Mahalanobis 64 outliers were removed with the final set at 983 responses retained. The accuracy increased chi sq from 2.992 to 2.243 and CFI from 0.954 to 0.972.

Observation number	Mahalanobis d-squared	p1	p2
988	81.926	0	0
942	88.294	0	0
941	87.084	0	0
940	93.014	0	0
939	96.628	0	0
934	82.257	0	0
900	122.185	0	0
899	94.588	0	0
898	87.121	0	0
887	95.184	0	0
885	94.268	0	0
884	91.081	0	0
862	130.127	0	0
831	94.783	0	0
817	111.937	0	0
816	96.753	0	0
812	100.125	0	0
802	115.05	0	0
801	107.17	0	0
717	159.531	0	0
692	87.363	0	0
671	83.476	0	0
670	108.425	0	0
627	94.956	0	0
626	121.051	0	0
625	83.28	0	0
623	125.635	0	0
621	98.275	0	0
617	85.186	0	0
586	97.152	0	0
563	87.997	0	0
514	154.966	0	0
511	88.494	0	0
496	112.6	0	0
477	145.773	0	0
428	199.985	0	0
427	140.945	0	0
425	101.627	0	0
424	90.607	0	0
423	92.986	0	0
422	86.215	0	0
419	83.057	0	0
405	129.021	0	0
384	177.52	0	0
383	196.953	0	0
378	204.609	0	0
368	94.117	0	0
367	89.871	0	0
366	122.912	0	0
351	120.49	0	0
341	131.152	0	0
321	180.911	0	0
320	120.242	0	0
319	88.745	0	0
298	116.46	0	0
275	89.825	0	0
265	158.959	0	0
264	128.262	0	0
263	97.55	0	0
262	97.034	0	0
260	103.269	0	0
256	105.287	0	0
255	99.103	0	0
253	85.436	0	0

13.9 Annexure: Report Structure

The report consists of 6 chapters with references and an appendix at the end with detailed explanations. Outline of Thesis:

- Innovation in the Indian context and the Introduction to the area of research and rationale. Literature review, taken from the several studies on Innovation and Innovation capabilities, the identified definition of Innovation for this study. And then Integrate the review to identify the research gaps. Emerging research gaps and questions are identified. From the literature review, the building of the Theoretical Model and concept map with the objectives of this study and hypothesis is drawn from the objectives to test.
- For the study design and methodology taking into consideration paradigms, gaps and objectives are set out for research design, sample design, Data Collection, and research tool.
- Analysis and findings of the study are done under descriptive statistics and Inferential statistics. In Descriptive Analysis, using SPSS, the basic character of the gathered data is checked. In Inferential statistics Exploratory Factor Analysis and Confirmatory factor analysis followed with Structural equation modeling Sample for testing the hypothesis.
- In the Discussion comparison to the present knowledge base is debated.
- In Concluding the contribution of the research to various entities is stated. With a stated contribution to the body of knowledge, to industry and practicing managers is stated.